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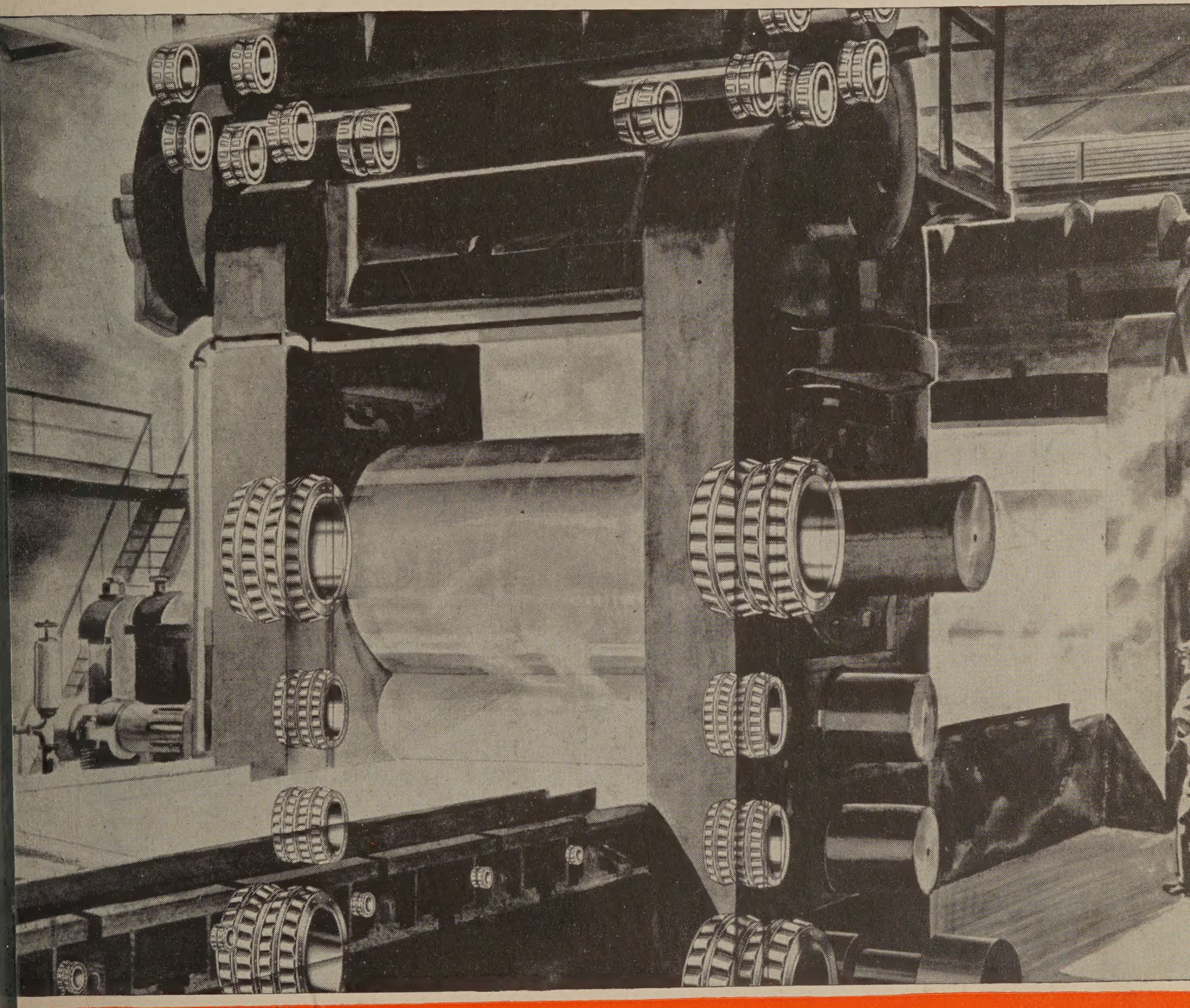
The IRON AGE

JULY 15, 1948



An X-Ray View Of A Modern Rolling Mill

This is a typical example of a completely roller bearing equipped mill stand in which Timken Balanced Proportion Bearings are used. It represents the last word in fast, accurate, economical metal rolling.

Through balanced proportion design, the *new* Timken Roll Neck Bearing makes possible 50% to 60% greater roll neck strength, with correspondingly reduced roll neck stress and deflection.

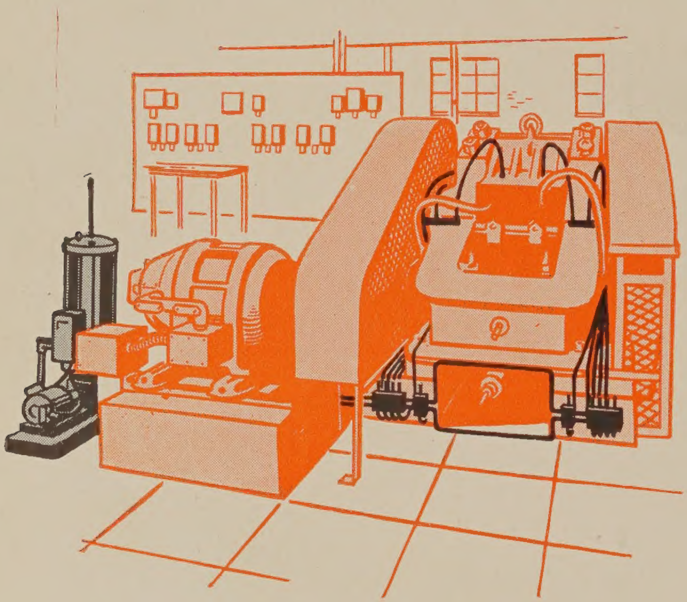
There is no lubrication problem when Timken Balanced Proportion Bearings are used — no complicated and expensive lubricating systems to make routine roll changes more difficult and time-consuming.

For specific information covering installations in new or existing mills—any kind, hot or cold, consult the mill builder or our engineers. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "Timrosco".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ↓ AND THRUST →← LOADS OR ANY COMBINATION →←

Stops bearing trouble on six rock crushers by installing Farval



FARVAL—*Studies in Centralized Lubrication No. 104*

FREQUENT bearing failures interfered seriously with production in an ore preparation plant. The material processed was an extremely hard flint-like rock, which not only generated tremendous bearing pressures in the crushers, but created a highly abrasive dust as well. Various methods of lubrication were tried, including drip systems, wick feeds, grease cups, and automatic oil cups. Many of these devices plugged up with dirt. Dust got into bearings and quickly ruined them, resulting in continual shutdowns for bearing replacement.

Finally, a Farval centralized lubrication system was installed on one crusher. It stopped the trouble. It was so successful that Farval systems were installed on the five other crushers. Now the swing jaw, Pitman and main eccentric shaft bearings on each crusher all receive adequate, automatic lubrication. There have been no bearing failures since Farval was installed.

Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. It does its work while the machine is in operation. Farval—the Dualine System with the Positive Piston Displacement Valve—that has but 2 Moving Parts—is Fully Adjustable—and with a Tell-tale indicator at each bearing to show the job is done.

Write for Bulletin 25 for a full description of Farval. The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

FARVAL

CENTRALIZED SYSTEMS OF LUBRICATION

THE IRON AGE, published every Thursday by the CHILTON CO. (INC), Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign

. . then you
dd a pinch
f *thyme*

There's an element of art in every business. The skills of the steel craft, shared and advanced through neighborly cooperation, have brought Barium customers the best possible steel and steel products.

Consider the advantages of Barium's coordinated facilities for melting, rolling, casting, forging, stamping, machining and fabricating the steel used in your products. All of us in the Barium corporate neighborhood are ready to do our part in the often complex job of procuring and processing the steel you specify.

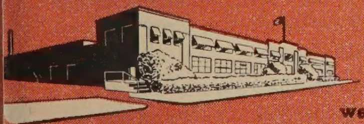
Get acquainted with the Barium subsidiary which can best advise you on your problems and supply your needs.

WE MELT, ROLL, CAST, FORGE, STAMP, MACHINE AND FABRICATE STEEL

Barium
STEEL CORPORATION
STEELWRIGHT TO THE NATION

ONE OF THE 16 BARIUM GOOD NEIGHBORS

HE GEOMETRIC STAMPING COMPANY
LEVELAND, OHIO
bsidiary of Barium Steel Corporation



Leading producer of medium and heavy metal stampings and assemblies. Geometric craftsmanship has served stamping users for over 30 years. Large modern plant has presses of 40 to 450 ton capacity . . . complete facilities in metal fabrication and welding . . . tool and die design and construction . . . engineering and redesigning.

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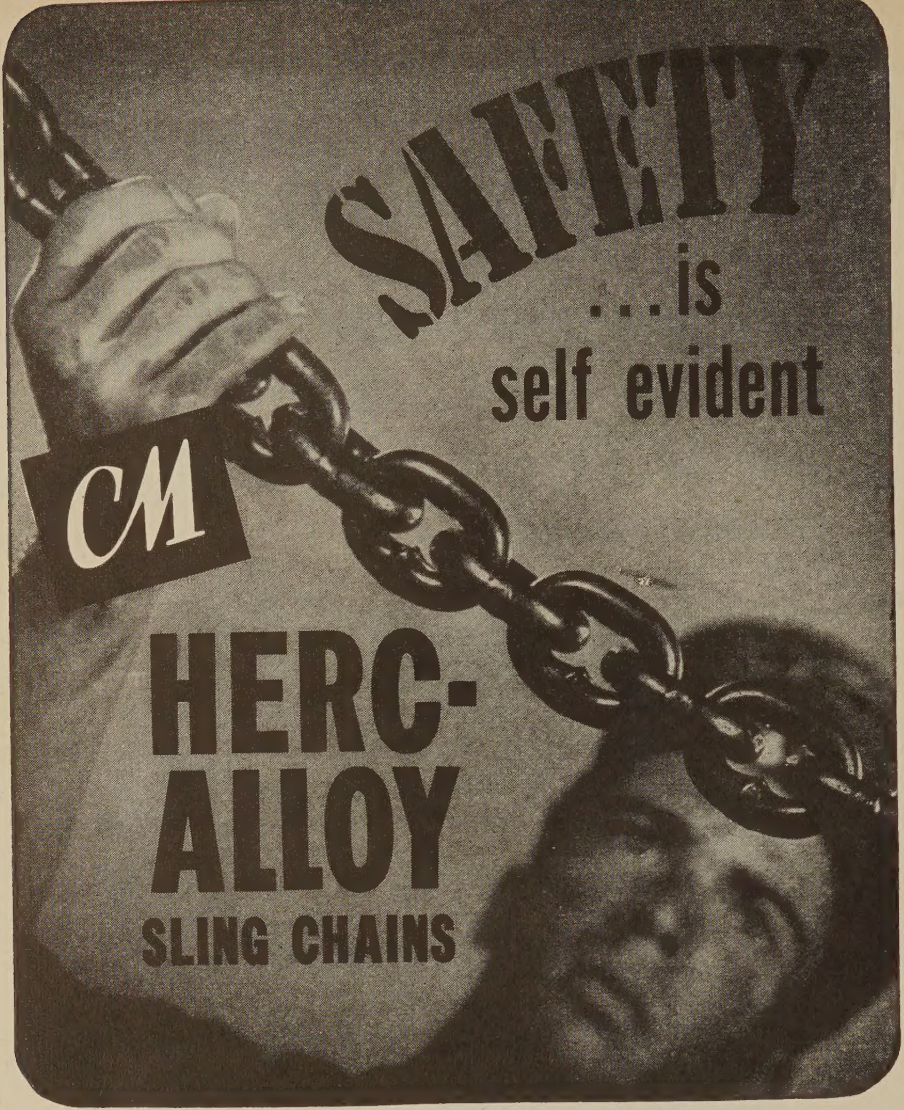
EXECUTIVE OFFICES
25 BROAD ST., NEW YORK, N. Y.

AMERICAN STEEL TRACTOR CORP., *Canton, Ohio* • CLYDE IRON WORKS, INC., *Duluth, Minn.* • CENTRAL IRON AND STEEL COMPANY., *Harrisburg, Pa.* BARIUM STEEL & FORGE, INC., *Canton, Ohio* • BARIUM EQUIPMENT CORP., BARIUM STEEL EXPORT, INC. • BAYONNE BOLT CORP., *Bayonne, N. J.* THE CUYAHOGA SPRING COMPANY, *Cleveland, Ohio* • THE GEOMETRIC STAMPING COMPANY, *Cleveland, Ohio* • PERMA-JACK CORP., *Cleveland, Ohio* PORCELAIN STEELS CORP., *Cleveland, Ohio* • THE DETROIT STEEL CASTING COMPANY, *Detroit, Mich.* • SHEFFIELD IRON & STEEL CO., *Sheffield, Ala.* KERMATH MANUFACTURING COMPANY, *Detroit, Mich.* • KERMATH (CANADA) LTD., *Toronto, Ontario, Canada* • REPUBLIC INDUSTRIES, INC., *N. Y.* GLOBE FORGE, INC., *Syracuse, N.Y.* • ERIE BOLT & NUT COMPANY, *Erie, Pa.* • WILEY MANUFACTURING COMPANY, *Mountville, Pa., and Port Deposit, Md.*



HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain... first to bear a serial number.
- Every CM HERC-ALLOY Sling Chain is alloy steel throughout...links, rings, hooks. There is only one grade... *the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should *never* be annealed.
- HERC-ALLOY Chains are lighter...stronger... easier to handle...outlast ordinary chains 4 to 5 times...cost less on the job.

HERC-ALLOY...the chain you can *SEE* is safe

● A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are standardizing on HERC-ALLOY... because HERC-ALLOY Chains are immune to unseen dangerous crystallization... because you can **see** when a HERC-ALLOY Chain needs repairs or replacing.

SLING CHAINS
...CARE
...USE
...INSPECTION

**Write for your copy of this new, informative booklet. No charge.*

COLUMBUS-McKINNON

CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

See us at Booth 116—National Safety Congress
Stevens Hotel—October 18 to 22—Chicago

Fatigue Cracks

(*Continued*)

ardize the spelling of this word as it applies to castings."

Mr. Workman is not kidding. He says, "This may seem to be a small matter; however, for sound philological and etymological reasons, the Society is extremely serious in its efforts in this behalf."

Reader John A. Davenport, who is connected with the War Department, rushes up waving a flag of truce.

> *"Webster," he soothes, "boils it down: grey is the British way of saying gray. And he lists gray iron only. I suggest gray iron for whatever it's worth except: grey iron for European destination or, 'Grey iron, eh what?' (or 'old top', 'pip pip', or any of those bally expressions which would convey the general idea.)."*

We don't know what edition of Webster the Society or Reader Davenport have, but ours is a particularly fine one. It can generally be counted on to stand firmly on the side of anarchy. It says:

> "GRAY, GREY *are etymologically and in general usage one and the same word, and no valid distinction in meaning can be drawn between them. A difference in connotation is nevertheless felt, apparently, by many persons,* GRAY *seeming to suggest a darker or colder shade than* GREY, *which thought of as a lighter tint, more delicate or in some way more impalpable. But this distinction has not established itself in usage."*

Is there anyone in the house who will insinuate that British castings are more delicate or impalpable? There's an international crisis brewing, we tell you.

Model T

• • In the tabloid front cover index to the June 17 issue, the top article was listed as "Drilling Ford Cranks, p. 72." When we turned to p. 72 to find out whether the brains department had remembered to set the brakes, adjust the spark and hand throttle, grasp the handle with the thumb underneath, give a quick snap, and pray, we were disappointed to discover that the article concerned an automatic transfer machine designed to dril oil holes in the crankshaft of the '49 Ford. That's nothing like the drilling we had when we learned to crank our Model T.

TOO MANY PITCHERS!

FOLKS, they're just coming in too fast—and we *do* mean *orders!* In anything like normal times, we'd be awfully happy to have you pitch your order down our alley. Our past averages speak for themselves.

But *now*—well, honestly fellows—there are too many pitchers on that mound. We're in there swinging as hard as we can but we can only manage to get hold of a few. And there just aren't any pinch-hitters on the bench to help us out.

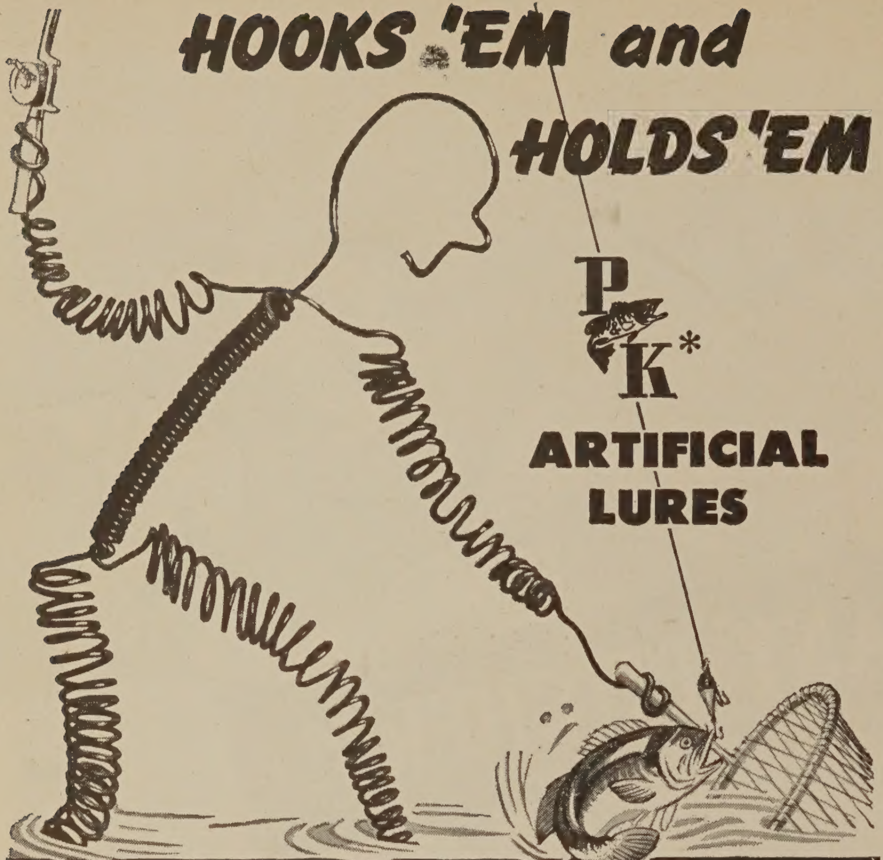
From your seat, our batting average no doubt looks weak at the present time. But we're doing the best we can and we're hitting 'em safe when we can get hold of 'em.

We're asking you to stick around for later innings when things settle down. That's when Wisconsin will really come through with those pay-off blows. Remember, the season isn't over yet. We hope we have a pennant winner for you.

WISCONSIN STEEL COMPANY

(Affiliate of International Harvester Company)
180 North Michigan Avenue Chicago 1, Illinois

WISCONSIN STEEL



HOOKS 'EM and HOLDS 'EM

P & K* ARTIFICIAL LURES

with hooks made of KEYSTONE WIRE

P&K's "Amazin' Maizie"—one of the real fish-getters among their 70 tested lures.

P & K fishing lures have the lively, life-like action the big ones can't resist. And, when they strike . . . WHAM! . . . they're snagged by hooks that hold!

P & K fish hooks are made of Keystone high carbon steel wire. The wire is ductile . . . capable of withstanding the severe strain of forming into fish hooks without fracture. It is perfectly adapted to the special tempering that makes P & K fish hooks strong and rugged. Their points stay sharp longer. Heavy nickel plating prevents rust.

We are proud that Keystone wire fulfills the exacting requirements necessary for high product quality. Whatever your industrial wire specifications, Keystone can normally supply them.

**P & K, Inc.,*
3450 Archer Ave.,
Chicago 8, Ill.

KEYSTONE
MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE
for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

Dear Editor:

STEEL PART PROTECTION

Sir:

We would be very interested in receiving any additional information or sources of information in regard to the process of oil protecting steel parts as mentioned in Newsfront of the May 25 issue.

F. J. CORT
Director Manufacturing and Assembly
Ford Motor Co.
Dearborn

• Jones & Laughlin Steel Corp. can give you further information on the process.—Ed.

ELECTRIC HOT TOPPING

Sir:

In the March 25 issue there appeared an article "Electric Hot Topping Steel Ingots." We would like to receive another copy of this article.

WILLIAM P. HENKEL
Metallurgist
Latrobe Electric Steel Co.
Latrobe, Pa.

INVESTMENT CASTING

Sir:

I am enclosing a money order to cover the cost of the booklet "Precision Investment Casting—Lost Wax Process."

ARNOLD GREENIUS
Metallurgy Research Asst.
University of British Columbia,
Department of Mining and Metallurgy
Vancouver

• The 96-page booklet is available at $1.00 a copy.—Ed.

RADIO FREQUENCY HEATING

Sir:

We would greatly appreciate your forwarding to us a reprint of the paper entitled "The Practical Economics of Radio Frequency Heating" from the June 10 issue.

M. C. PARCHE
Carborundum Co.
Niagara Falls

BOOM CRANE

Sir:

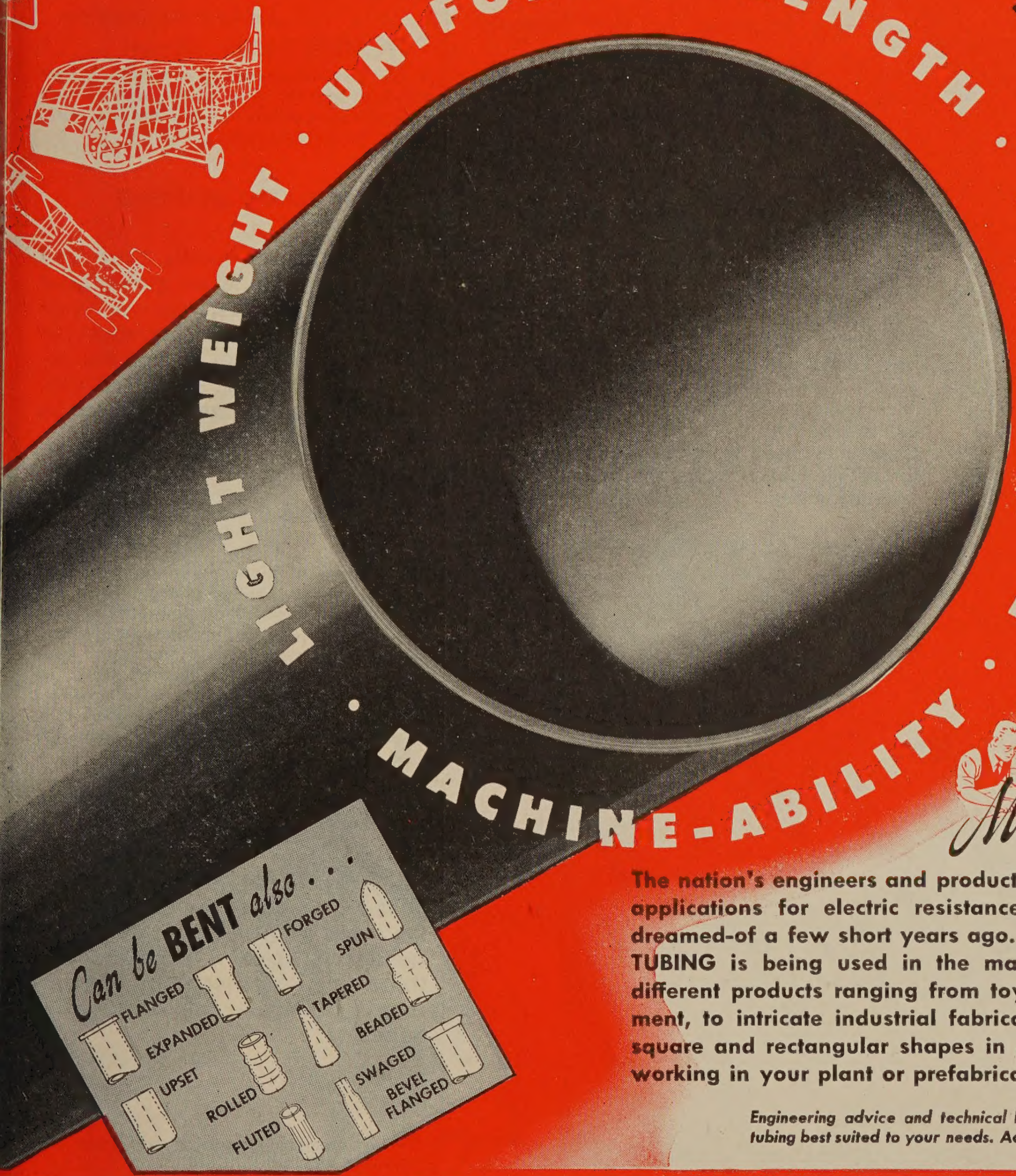
We are planning on putting up a boom type crane. I think it is also spoken of as a stiff leg derrick. The boom should be approximately 75 ft long. It should be able to turn in a complete circle and operate fairly fast. The average log which we plan to handle with the crane will weigh about 2000 lb, but the derrick should be able to handle 8 or 9 tons. We have received a

Michigan WELDED STEEL TUBING

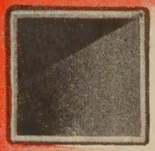
ROUND

The Modern Electric Resistance Welded Steel Tubing

LIGHT WEIGHT • UNIFORM STRENGTH • ECONOMICAL • MACHINE-ABILITY



¼" to 4" O. D. 9 to 22 gauge



SQUARE

½" to 2" 20 gauge —1" to 2¾" 14, 16, 18 gauge

RECTANGULAR

½" to 2" 20 gauge—1" to 2¾" 14, 16, 18 gauge

Men of Vision,

The nation's engineers and product designers are finding new applications for electric resistance welded steel tubing undreamed-of a few short years ago. MICHIGAN WELDED STEEL TUBING is being used in the manufacture of thousands of different products ranging from toys, home and office equipment, to intricate industrial fabrications. Available in round, square and rectangular shapes in a wide variety of sizes for working in your plant or prefabricated by Michigan.

Engineering advice and technical help in the selection of tubing best suited to your needs. Address your inquiries to:

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More Than 30 Years in the Business

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The Life of Your Product Hangs by a THREAD

The screws, bolts, nuts or other threaded fastenings used in the assemblies of your product are determining factors in the length of its consumer service.

HOLTITE
Engineered Fastenings
REG. U.S. PAT. OFF.

are precision-made of the finest materials to insure speedy application and enduring service. Accurate and rugged they effect production economics by reducing driving time, waste and spoilage. But most important, in the assemblies of your product their precise, uniform thread form and structural strength defy the loosening effects of vibration to assure long, trouble-free service. Specify HOLTITE for your next fastening requirements.

CONTINENTAL SCREW CO. New Bedford, Mass., U.S.A.

list of crane manufacturers from you and will appreciate any further suggestions you can make after considering the above requirements.

ROSS KREAMER
Cumberland Veneer Co.
Burnside, Ky.

BEARING SHELL TINNING

Sir:

Could you tell us of a book on tinning bearings. We are tinning large bearing shells of cast iron and need some help. We need to know how to get the grease out of shells and the best way to tin them.

RANGER MACHINE CO.
Ranger, Texas

• We have sent tearsheets of an article from our April 4, 1946 issue dealing directly with your problems in tinning large bearing shells. —Ed.

CHROME PLATED SHAFTING

Sir:

We use approximately 200 tons a year of 1 to 3 in. diam ground and polished steel shafting. A large portion of this shafting must be chrome plated 0.001 in. on the diameter before being assembled. Can you tell us where we could procure chrome plated shafting?

W. J. YOUNG
Director of Purchases
Hydraulic Equipment Co.
Cleveland

• We know of no manufacturer marketing shafting already chrome plated. There are a number of firms selling precoated or clad strip, sheets and plates, but none supply bars. Thus it would seem necessary for you to have the shafting plated after purchase from one of your normal sources. As an alternative, stainless steel shafting might be used if it would meet your requirements economically. —Ed.

ANNEALING FURNACES

Sir:

We are trying to locate sources of supply for small gas fired annealing ovens or furnaces for annealing small tubular steel parts. Something having between 20 and 40 cu ft of capacity for the work to be annealed.

C. W. KINGSBURY
W. R. Weaver Co.
El Paso, Texas

• A list of manufacturers of such ovens has been sent.—Ed.

POWDER HEAT TREATING

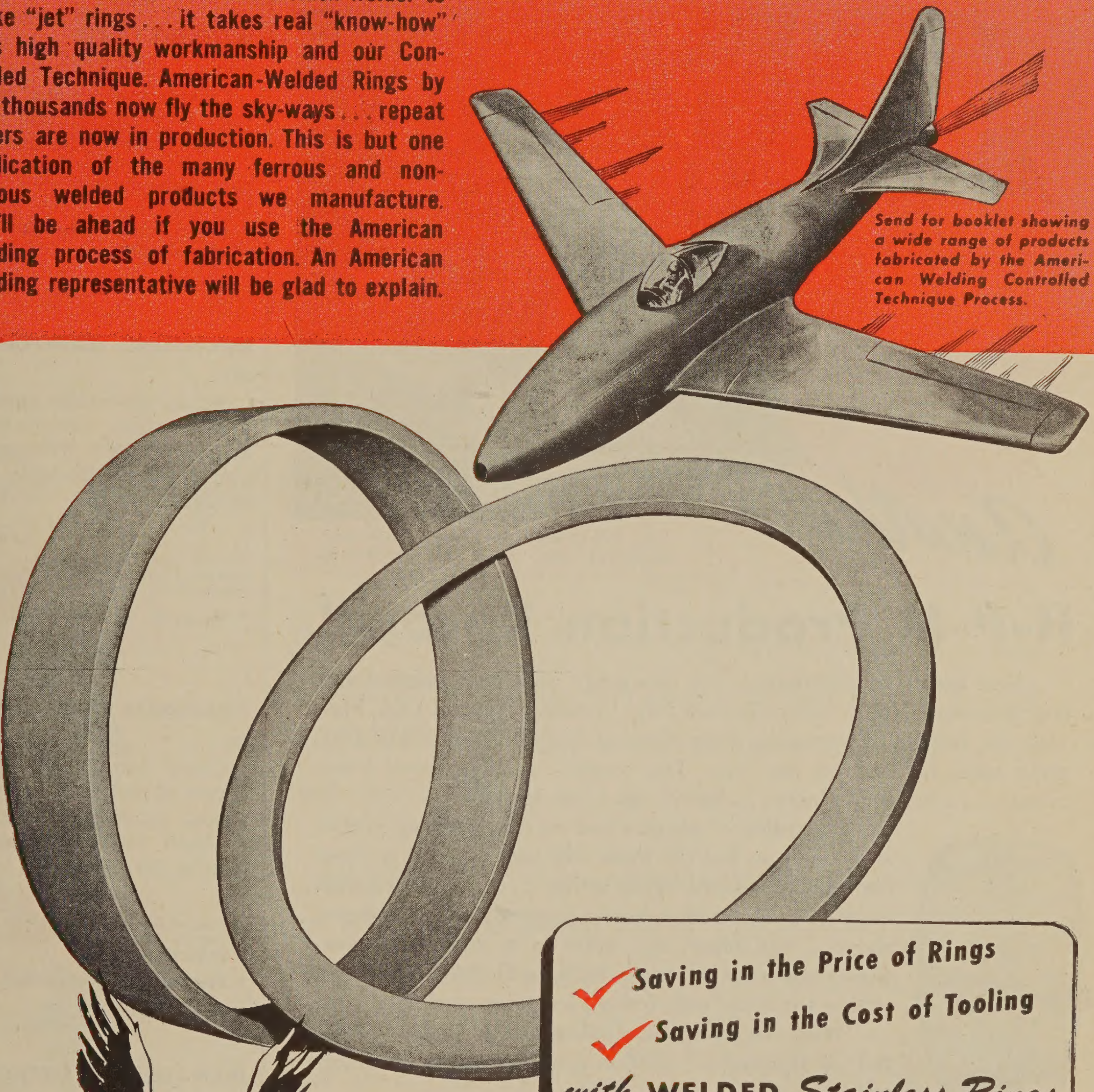
Sir:

In the Newsfront of your June 3 issue an item reports that excellent results are claimed for a powder

Jet Engines Use Welded Heat Resisting
STAINLESS STEEL RINGS

by AMERICAN WELDING

It takes more than steel and a flash welder to make "jet" rings . . . it takes real "know-how" plus high quality workmanship and our Controlled Technique. American-Welded Rings by the thousands now fly the sky-ways . . . repeat orders are now in production. This is but one application of the many ferrous and non-ferrous welded products we manufacture. You'll be ahead if you use the American Welding process of fabrication. An American Welding representative will be glad to explain.



Send for booklet showing a wide range of products fabricated by the American Welding Controlled Technique Process.

✓ *Saving in the Price of Rings*
✓ *Saving in the Cost of Tooling*
with **WELDED** *Stainless Rings*

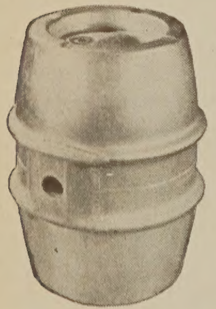
THE AMERICAN WELDING AND MANUFACTURING COMPANY
120 DIETZ ROAD • WARREN, OHIO

1000
Aluminum
BEER
BARRELS
A
DAY!
Another
HPM

This H-P-M draws beer barrel halves with progressive dies. Cycle time—25 seconds.

H-P-M Production Record!

Beer barrels of aluminum? The idea might have been laughed at a few years ago. Not so today. Benson Mfg. Company, Kansas City, Mo., with the help of its versatile, money saving H-P-M FASTRAVERSE press, went to work on the idea. The results . . . a beer barrel every minute . . . a better product . . . a lighter one . . . at less cost.



Regardless of whether you are deep drawing steel or aluminum, an H-P-M Press will step up your production. It has smooth, rapid action . . . can be fitted with single or double action dies or progressive dies as shown above . . . will blank and draw in a single operation, wiping out blanking costs. With an H-P-M, there's less chance for scrap with today's irregular stock.

Want to know more about these money saving H-P-M Hydraulics? Call in a nearby H-P-M engineer or write today.

THE HYDRAULIC PRESS MANUFACTURING CO.
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FASTRAVERSE METAL WORKING PRESSES

Bulletin 4706 will convince you—An H-P-M Fastraverse Press has all of the things you need to save money on metal forming jobs. Write for a copy today.

HPM All-Hydraulic Self-Contained Metal Working Presses

REVOLUTIONIZING PRODUCTION WITH HYDRAULICS SINCE 1877

heat treating method used in hardening steel. We would be pleased to know where we can get further information on this method.

L. L. THOMAS
Engineer

Bradford Motor Works
Bradford, Pa.

• **Necamp Metallurgical Laboratory, New York, markets the powder and will give you further information on the process.—Ed.**

WELDING HINTS

Sir:

Please send us one copy each of your Welding Manual and of your Metal Finishing Manual.

I. J. GREGG

General Electric Co.
Schenectady

• **Copies of both manuals are available at $3.00 each.—Ed.**

DIECASTING UNIFORMITY

Sir:

Would appreciate receiving a copy of the article "Causes of Diecasting Irregularities." The article ran in two parts in the Nov. 13 and Nov. 27, 1947 issues.

F. A. HORNING
Purchasing Dept.

Bendix Aviation Corp.,
Bendix Products Div.
South Bend, Ind.

• **Tearsheets have been sent.—Ed.**

GRAPHICAL CORRELATION

Sir:

Could you supply us with two copies of the article entitled "Graphical Correlation—Its Application to Steel Mill Problems" from the Nov. 6, 1947 issue.

R. B. MEARS
Manager

Carnegie-Illinois Steel Corp.,
Research Laboratory
Pittsburgh

• **Reprints have been mailed.—Ed.**

MANAGEMENT METHODS

Sir:

Please forward a copy of your book "Practical Management." A check for $3.00 for the book is enclosed.

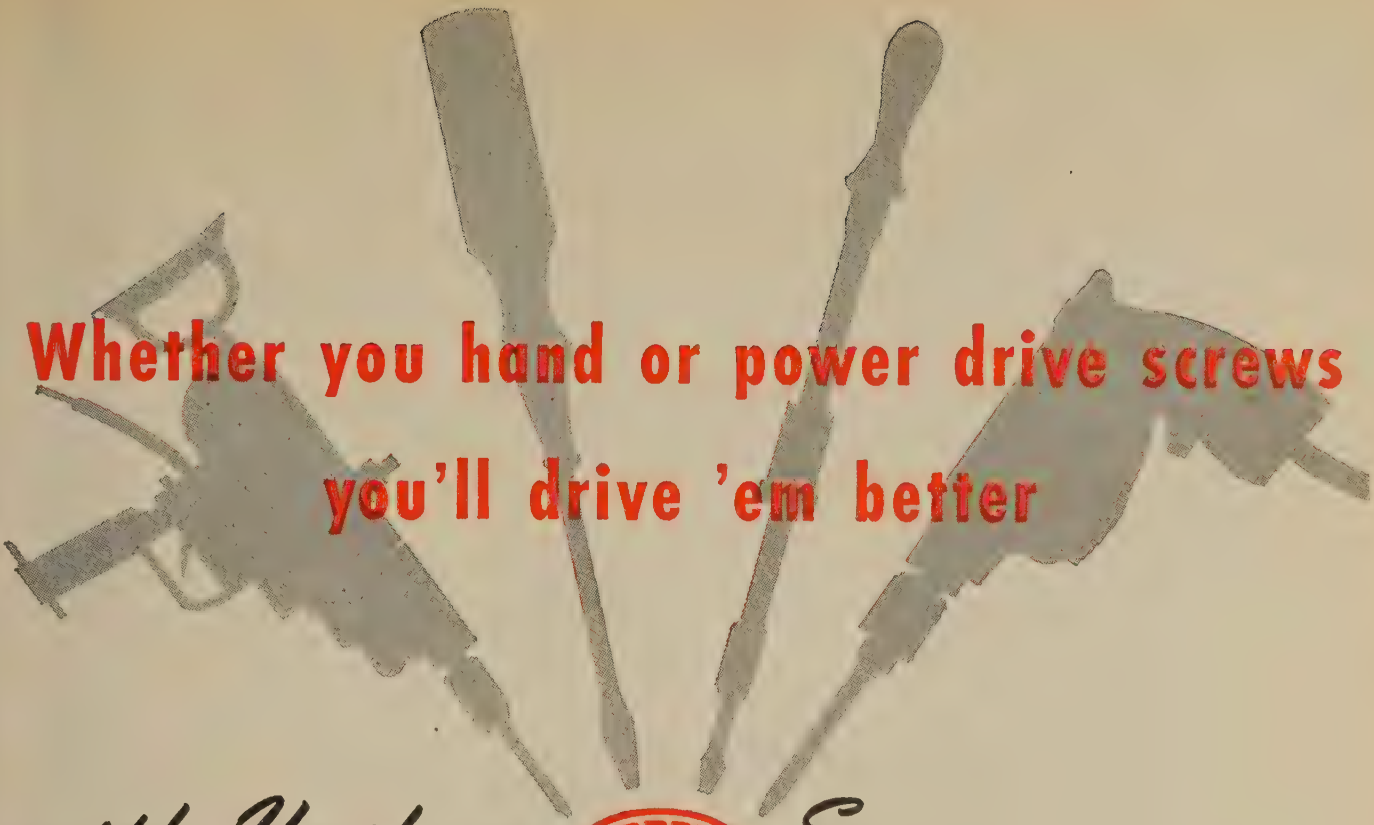
L. A. SHEA

Lindberg Engineering Co.
Chicago

RATING SHOP JOBS

Sir:

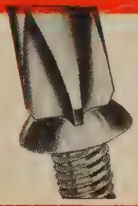
I wish to purchase your publication in booklet form giving information on rating shop jobs. I am



Whether you hand or power drive screws you'll drive 'em better

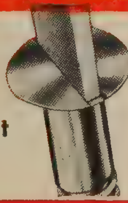
with Uniform CORBIN Screws

CORBIN-PHILLIPS SCREWS



centered driving

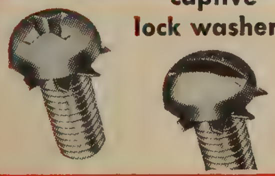
CORBIN SLOTTED SCREWS



true saw-cut slots

CORBIN SEMS

captive lock washers



The faster the pace, the more important uniformity is to *you.* Quality *can't* be sacrificed to stepped-up production — so smart production men depend on Corbin Screws because they know their assemblers get a *good* one every time.

Quality *and* quantity production is almost automatic when you drive uniform Corbin Screws. Grab some — place 'em — *drive* . . . easier, faster, better . . . no matter *how* you drive. Corbin Screws are available in all sizes and styles to meet your needs, for wood, metal, or plastic. Insist on Corbin.

S-85

CORBIN SCREW

DIVISION

THE AMERICAN HARDWARE CORPORATION, NEW BRITAIN, CONN.
Warehouses: New Britain, New York, Chicago

interested in the following articles: Evaluating Shop Jobs, Applying the Point Method of Evaluating Jobs, What's Your Job Worth, Job Rating, and Planned Time Study Standards.

T. B. KNUTSON

Link-Belt Co., Caldwell Plant
Chicago

• The book containing these articles is entitled "Practical Management." Copies are $3.00 each.—Ed.

SPARK TESTING

Sir:

We would appreciate the receipt of any information relative to instruction or training of spark testers. I noticed in a recent issue that someone else had requested similar information and that you had forwarded them some literature on the subject.

A. J. ADAMITIS

Lamson & Sessions Co.
Chicago

• Tearsheets of "Training Spark Testers" from our July 18, 1946 issue have been sent. —Ed.

CARBIDE MILLING CUTTERS

Sir:

We understand you have published a 96-page booklet entitled "How to Use Carbide Cutters for Milling." We would appreciate receiving a copy.

R. T. BEEGHLY

Metal Carbides Corp.
Youngstown

• Copies are $1.10 each.—Ed.

SKIMMER

Sir:

We would like to receive more information on the steel skimmer for skimming molten aluminum as mentioned in the Newsfront of your May 4 issue.

A. J. TROMMERHAUSEN
Development Engineer

Permanente Metals Corp.
Tacoma, Wash.

• Duraloy Co., Scottdale, Pa. will give you further information.—Ed.

PICKLING EQUIPMENT

Sir:

We are in the process of developing a sheet and strip job pickling department at our new plant facility in Union, N. J. and would appreciate receiving from you any pertinent information concerning

To eliminate waste and scrap

NORTHERN OVERHEAD ELECTRIC **CRANES**

Measure and lay out accurately—pick it up with a NORTHERN OVERHEAD ELECTRIC CRANE and move it quickly and safely to the shear—cut off just what's needed, no more, no less—rush it to where it's needed for processing! That's the most dependable formula today for eliminating hard-to-replace, high cost waste, scrap and production delays.

★ Let us send you Bulletin No. 118-C ★

OVERHEAD ★
ELECTRIC CRANES ★
AND HOISTS ★

NORTHERN
ENGINEERING WORKS
2615 Atwater St., Detroit 7, Mich.

RB&W
RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY
EMPIRE Fasteners
BOLTS EMPIRE NUTS-RIVETS
100
1/4
CARRIAGE BOLTS
FULL SIZE BODY
3 3/4
EMPIRE
FLAT HEAD STOVE BOLTS
1
5/16
100
HEX NUTS

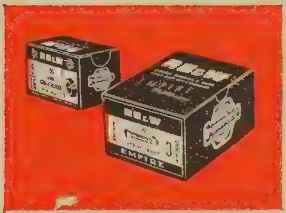
Our New Packages

CUT YOUR FASTENING COSTS 3 WAYS

RB&W's consistent effort to help you keep fastening costs low, is typified by the new, attractive package developed for RB&W bolts, nuts, screws and rivets.

Your first glimpse of the package shows the label information to be clear and complete. Big black type on a white background and the product pictured on the label save your men time and error in selecting from stock.

This box is designed to give maximum opening for accessibility of contents. It is labelled upside down purposely to prevent bottom dropping out while handling . . . it ends all problems of dropping and spilling.



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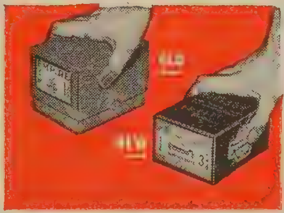

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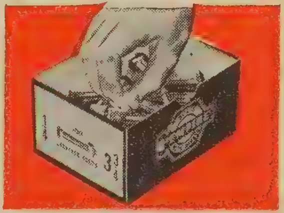

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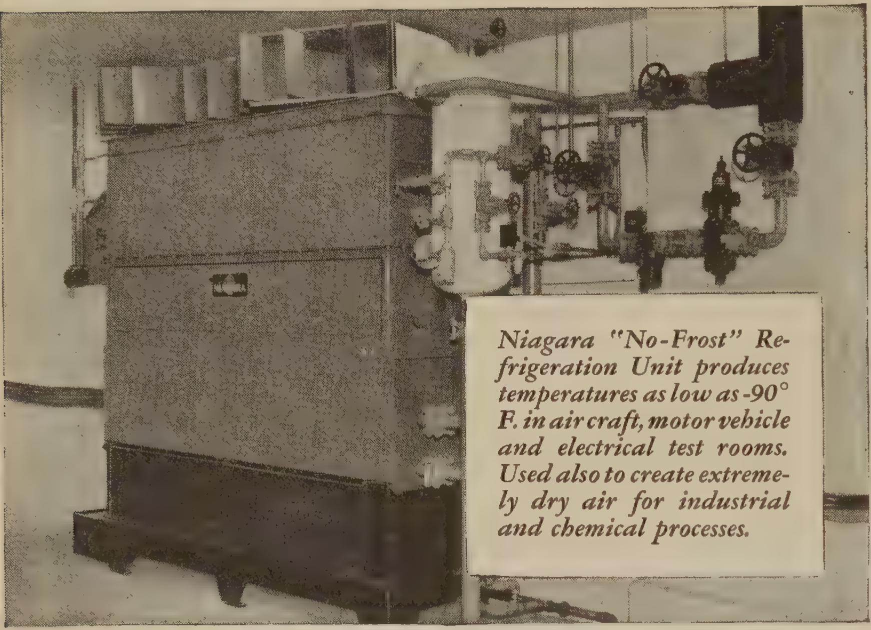

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tanks, acid, neutralizers, equipment, agitators, etc., that may be available. Any brochures, pamphlets or other information will be helpful.

D. A. FRIEDMAN

Hanover Steel Corp.
New York

● We have asked a number of producers of pickling equipment to supply you with literature and information.—Ed.

PICKLING LIQUOR WASTE

Sir:

In the June 26, 1947 issue there appeared an article "Lime Treatment of Waste Pickle Liquors." Would it be possible for you to send me tearsheets of this, as it would be valuable to us in our neutralization of pickling liquors.

CHARLES D. TOWNSEND

A. B. Chance Co.
Centralia, Mo.

● Tearsheets have been sent.—Ed.

TOOL STEEL PRODUCERS

Sir:

Will you please mail a complete list of the manufacturers of tool steels in this country. We would like to know each company's rated capacity and total sales for the year of 1947.

H. E. STOOPS
Buyer

Caterpillar Tractor Co.
Peoria, Ill.

● A list of producers of tool steel bars (rolled or forged), with the rated annual capacity of each, has been sent. Most of the companies also produce other alloy steels and/or carbon steels. Hence their statements rarely separate tool steel sales from the overall sales totals, and figures for tool steel sales alone are not available. We are sending, however, a copy of The Iron Age Financial Analysis of the Iron & Steel Industry for 1947 showing the total sales for the major producers.—Ed.

HEAT RESISTANT ALLOYS

Sir:

Will you please send two copies of the reprint entitled "A Summary of Heat Resistant Alloys from 1200°F to 1800°F." The article ran in three parts beginning in the March 18 issue.

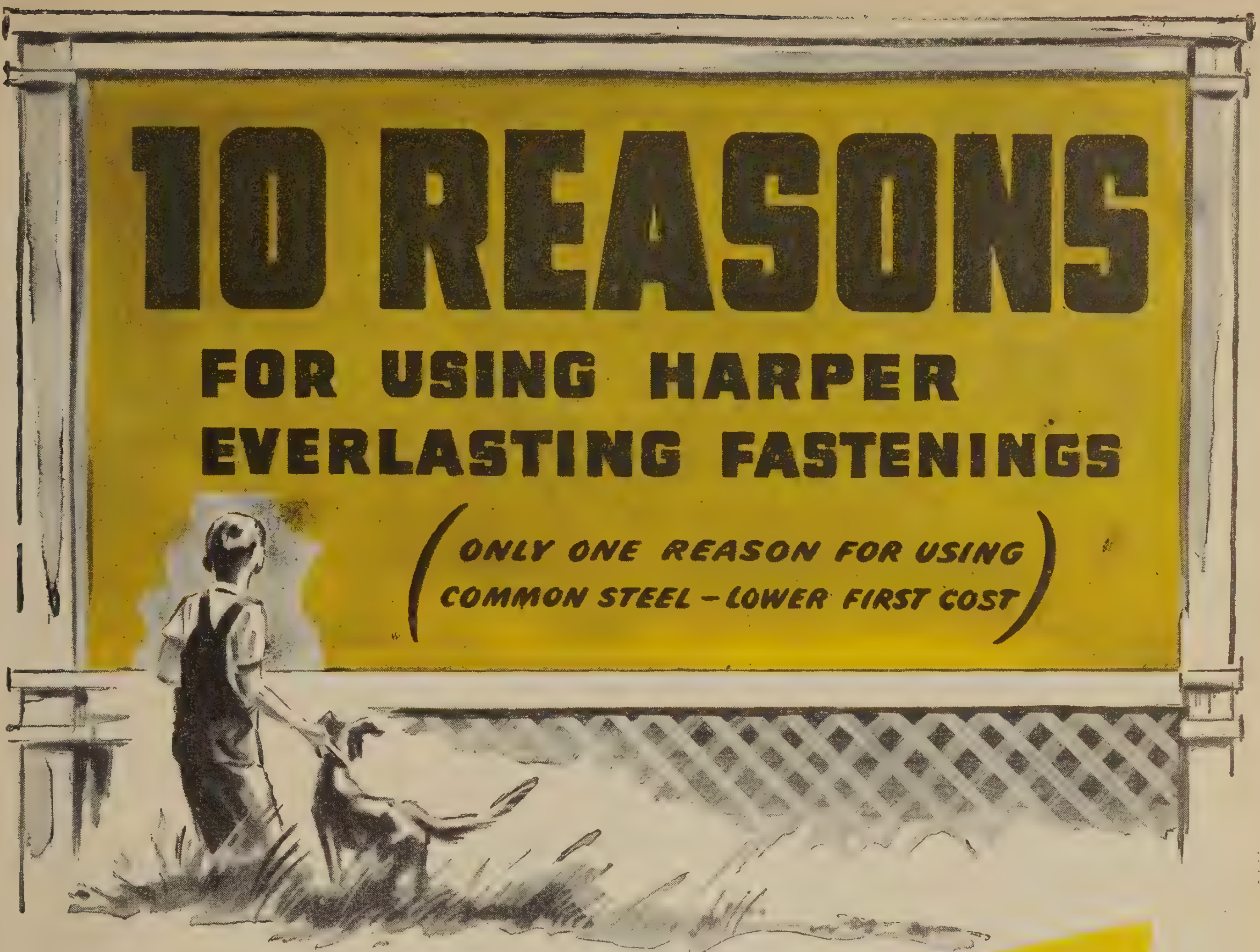
J. C. McKENZIE
Chemical Engineer

Thompson Products, Inc.
Cleveland

PRODUCTION CONTROL

Sir:

We note with interest the article in the June 3 issue entitled "Production Control in a High Alloy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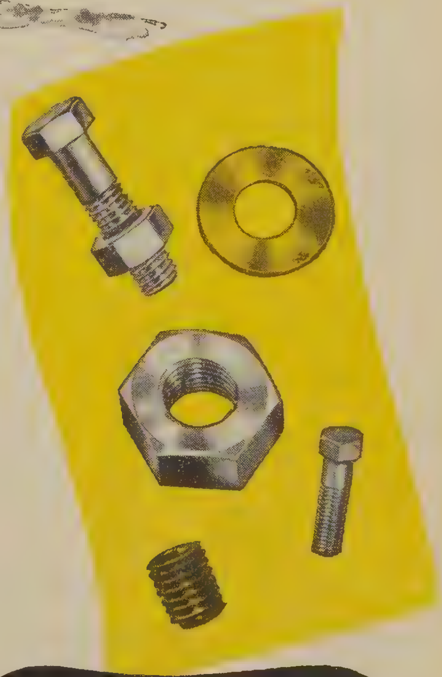

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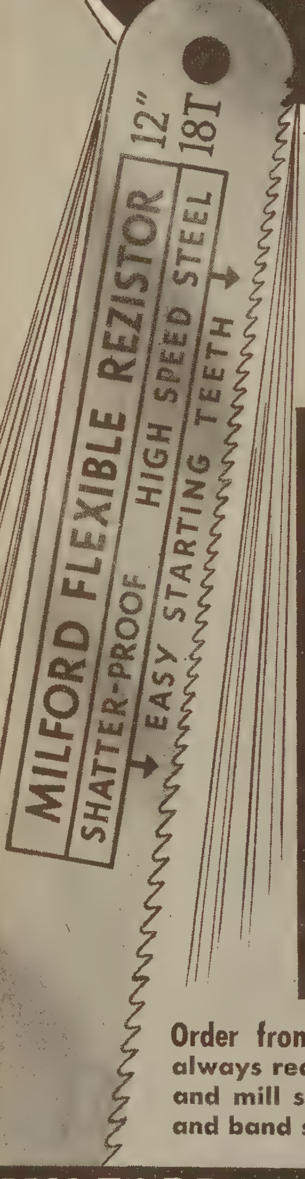

Steel Plant." Since I must pass our company issue along, I would appreciate receiving a reprint.

W. L. GRAHAM
Gen'l. Supervisor Production Planning
American Steel & Wire Co.
New Haven, Conn.

NONFERROUS ALLOY SPECS

Sir:

Please send your handbook on "Nonferrous Alloy Specifications."

KARL SCHREIBER
Metallurgical Dept.
Detroit Lubricator Co.
Detroit

• The handbook is available at 25¢ each, or at 16¢ each for 5 or more copies.—Ed.

POWDER METALLURGY

Sir:

We would greatly appreciate your forwarding a copy of the article "Low Cost Equipment for Powder Metallurgy" from April 8 issue.

LOUIS GOLDSTEIN
Presmet Corp.
Worcester, Mass.

TUBE MANUFACTURERS

Sir:

We would like to know if you could list for us the names of tube manufacturers in the U. S.

MAURICE M. TAYLOR
Morry Mfg. Co., Inc.
Pontiac, Mich.

• We have sent you a listing of pipe and tube manufacturers.—Ed.

SPARK TESTING

Sir:

We would appreciate your sending a reprint of the article "Spark Testing" from the July 18, 1946 issue.

E. C. JASPER
Metallurgist
Victor Adding Machine Co.
Chicago

• Tearsheets have been mailed.—Ed.

PRODUCTION MANAGEMENT

Sir:

We would appreciate your mailing us a reprint of "Putting Production Control to Work" as it appeared in your May 16, 1946 issue.

A. G. BERGMAN
Production Manager
Heppenstall Co.
Bridgeport, Conn.

• Tearsheets have been sent.—Ed.

The
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Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price United States, its Territories and Canada $8; other Western Hemisphere Countries $15; Foreign Countries $20 per year. Single copy, 35c. Annual Review Number, $2.00.

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A Break

IN spite of ample news coverage and extended editorial treatment, we believe the importance of Tito's quarrel with the Kremlin is still underestimated. Tito has been the white-haired boy of the Reds for many years. Although his real past is somewhat obscure, it is known that he spent several years in Moscow training for his Balkan proconsulship; that he was thoroughly indoctrinated with communist ideology; that he had, presumably, accepted the finality and infallibility of Politburo authority.

This Croatian Caesar has now declared his independence and "thrown the book" at his Cominform comrades. Aside from the blasphemous heresy of this action and the return of the Balkans to their traditional condition of restless ferment, the episode has a deeper meaning - all of it good.

It may be recalled that Stalin made a deal with Churchill during the war under which Allied support in Yugoslavia was shifted from Mikhailovitch to Tito; that the latter quickly revealed himself as a single-minded missionary of Moscow. Elements friendly to the western powers were purged and the Slovaks became the first sure satellite of the Soviet in the important fringe of Balkan states. This proved a major strategic victory for Joe.

Stalin moved on to other triumphs, abetted by the precipitate demobilization of American military power after V-J Day. He moved with a firm hand into the great power voids left by the destruction of the Axis powers. In turn, he became a menace to world peace and the security of the United States, greater even than that posed by Hitler, Tojo and Mussolini. The Marshall Plan and American rearmament are both developments traceable directly to the disturbing progress of Russian power in the postwar period.

The ugly possibility of a third World War became and still is a distinct threat. This grim probability is tempered only by the known and suspected infirmities of the Soviet State.

Communism, as exemplified by Russia, has four major weaknesses, the significant emergence of any one of which might reduce the probability of armed conflict and by the same token improve the prospects of our own survival.

Without attempting to mark their relative importance, these four elements of Soviet weakness are: The appalling inefficiency of production in a communist economy, the monstrous blight of personal freedom under a Red dictatorship, the grave problem of succession in the Russian state, and, finally, the powerful nationalistic forces operating upon the major components of the Red Empire which tend to break it up into smaller units.

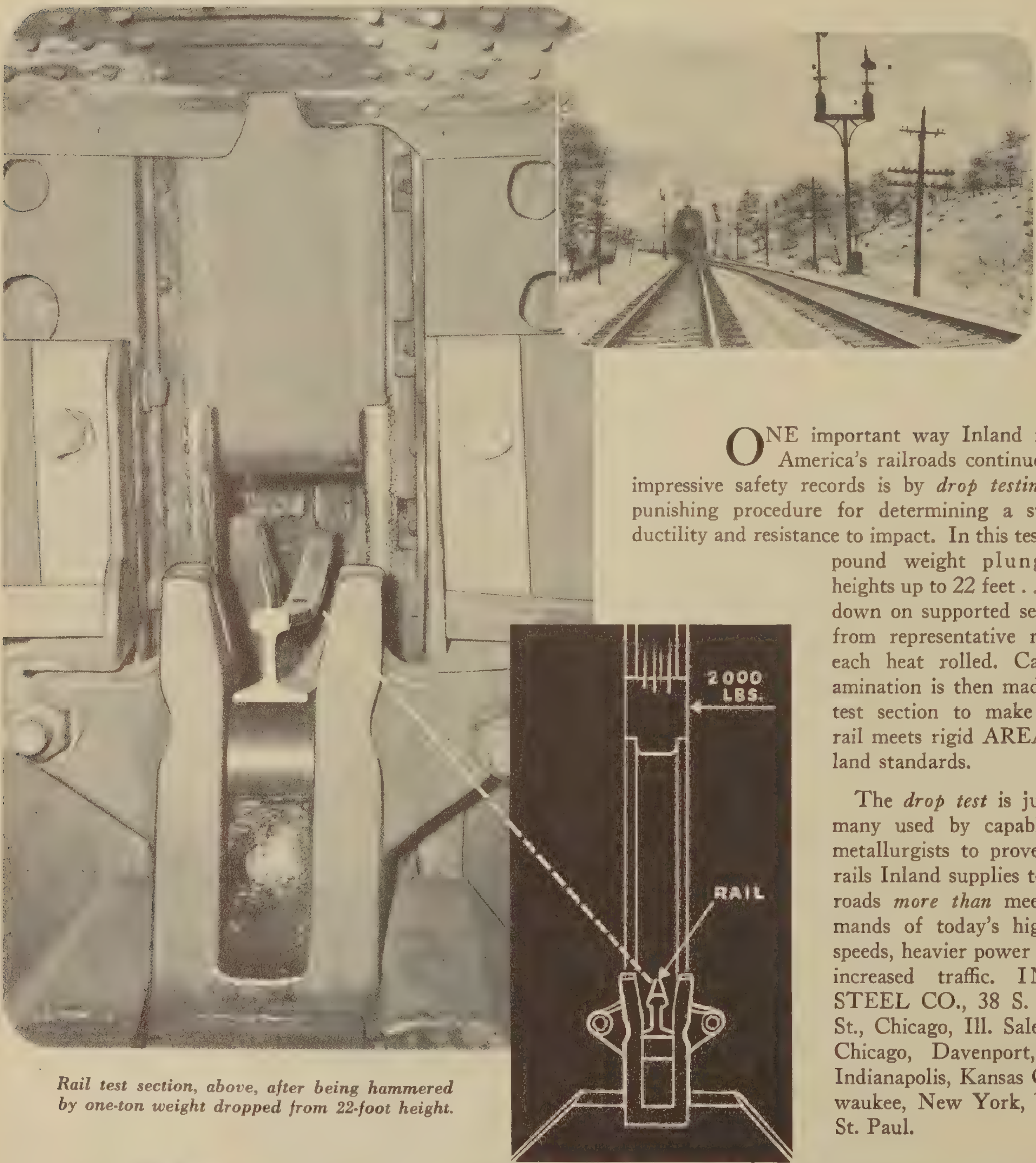
Tito's action falls within the last of this group of infirmities. This is no petulant revolt by a Balkan leader concerned only with his personal position. The latter, to be sure, is not absent. Primarily, however, this schism within the communist family represents an authentic desire of Yugoslavia for an independent national existence. It does not propose to become another Soviet Republic. Its emergence as an independent power, whatever its ideology, marks a serious crack in the Soviet monolith. Here are 36 divisions and a strategically situated Balkan country which can no longer be used as pawns in the ruthless game of Soviet power policies.

Men of peace throughout the world may well rejoice.

Joseph Stagg Lawrence

A KNOCK-OUT DROP...

that helps railroads set remarkable safety records



Rail test section, above, after being hammered by one-ton weight dropped from 22-foot height.

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The IRON AGE
JULY 13, 1948

NEWSFRONT

► One reason why steel companies wanted a ruling from NLRB on the coal contract snag (refusal to sign a union shop contract which steel firms say would violate the Taft-Hartley Act unless an election were to be held) was to be on the safe side when steel contracts come up next year. If steel firms signed a union shop contract with John L. Lewis they would have to do the same for Philip Murray. This they won't do without an election or -- without some government order. Basically everyone knows that most miners would vote overwhelmingly for the United Mine Workers, but the lawyers want it all straight from a legal standpoint.

► The price umbrella held over nonintegrated steel companies was closed by semifinished price advances this spring. But the changeover to f.o.b. mill steel selling will break most of its ribs. Many nonintegrated mills will experience a substantial cost increase when they have to pay full freight on semifinished steel -- their principal raw material.

► Some steel consumers have been able to lower their freight cost by making use of the rate for steel products fabricated-in-transit. Many more steel consumers might well be in a position to take advantage of the important savings permitted by this rate. Constantly rising freight costs would certainly warrant its consideration.

► The program to put automatic transmission on all passenger cars is slowing down. But the trend seems as well established as ever. It is understood that Buick will make its dynamatic available on its other lines of cars within the next year. The new Ford transmission will be available on the Lincoln and Mercury early in 1949. Chevrolet is ready with a new automatic transmission it is reported, but will not offer it to the public for at least a year.

► Peacetime use of atomic energy took another forward step recently when another of the major rubber companies opened a new laboratory costing several million dollars. The application of atomic energy to crude and synthetic rubber, chemicals, plastics and horticulture will be intensively studied it is reported.

► Desire of some of the country's leaders for ERP aid is believed in diplomatic circles to be the real reason for Yugoslavia's expulsion by the Cominform. High grade machinery, obtainable only from the West, is desperately needed.

► With all large industries having given away to the third round of wages -- except steel which is on the way -- the morale of the steelworker is not high as he waits for the eagle to scream. Reports from the field indicate steel workers are restive over the situation. This tension extends also to the white collar men who as a rule get a raise when the union members get theirs.

► The military armament program is not expected to interfere seriously with auto production during 1948. Large scale use of steel for military planes and vehicles will be delayed at least until next January unless some unforeseen development occurs according to competent observers.

► High pressure converters weighing 300 tons each are required for one process in the recovery of oil from coal. Approximately 45 of these vessels and much supplementary equipment made of steel will be required for a plant producing only 10,000 barrels a day. The Bureau of Mines is pioneering this development with a 600 barrel a day pilot plant at Louisiana, Mo. There are only 3 steel plants in the country that have the facilities to produce and handle the heavy steel forgings for the converters.

► House of Commons is hearing complaints about people bringing foreign cars to Britain, selling them on the black market, and breaking promises to pay duty. To close this loophole, the Government has given Customs power to seize all cars in duty-free deals. An instance is reported where two cars were brought in at a quoted price of $5600 and sold a few days later for $23,600.

► The spook in some corner for industrialists both from a personal point and from a company standpoint is the almost certainty that real estate taxes are on their way up. Most cities and municipalities are short on sewage plants, roads, and other municipal work that has not been done for years despite a tremendous increase in population. Not all the new revenue that will be expected can be brought in from new owners. It will come from higher assessments, higher rates or a combination of both. Construction backlogs for schools, roads, hospitals, water works, etc. is astronomical on the drawing boards.

► A Midwestern manufacturer has received a contract for hollow steel propeller blades from Wright Field. He is now setting up plant facilities to make these blades in an old bomb plant that he operated during the war.

The Tool Engineering

The keystone in efforts of industry to achieve great productivity and higher quality at lower cost is the tool engineering department. This article tells how Reliance Electric & Engineering Co. has organized its tool engineering department to obtain the most effective use of its facilities. Specific examples of how this department has handled various projects are given.

INCREASED production, improved quality and lower manufacturing costs have received renewed emphasis throughout the metalworking industry during the past few years as a result of strides made in the development of machines, methods and materials. The return of intensified competition in many fields, such as electric motor manufacturing, has made it increasingly essential to explore any practical opportunity for increasing production, bettering quality and lowering cost. This factor challenges tool designers and engineers and accounts for the attention being given by Reliance engineers to tool engineering concepts, practices and organization.

Basic economics of making electric motors, as in producing other items, depend largely on good tool design and efficient construction. With proper planning and tooling, uniformly high productive efficiency should be achieved at minimum unit cost.

Organizationally, Reliance tool engineering functions are set up to attain these goals. Three main groups: (1) tool design, (2) tool manufacture, and (3) tool inspection, making up the Tool Engineering Dept., which itself is a part of the General Engineering Dept. Each group, in turn, is divided into a number of smaller units to expedite development of tools, jigs, fixtures, dies, gages, arbors, mandrels, templates, etc., for all manufacturing operations in four plants; and to facilitate design of special machines and equipment for stepping up output, improving quality, and lowering costs. The complete organizational breakdown of the Tool Engineering Dept., and its relative status to the operating divisions of the company are shown in fig. 1.

The tool engineering organization is company-wide, functioning as a central agency that serves the tooling demands of all four plants. It must be familiar with the production methods, processes, equipment, layout, materials used, and operating conditions at each plant, which vary from one plant to another. Hence, Reliance tool engineers must design and develop tools best suited to meet existing conditions.

The new Ashtabula Div., for example, which is set up for volume straight-line production of 1 to 20 hp ac and dc motors, requires different tooling than used by the Ivanhoe Div., where there are relatively small production runs of motors from 20 to 500 hp, many of special types. Tool costs in every instance are based on closely estimated annual usage, and tool design also takes this factor into account.

Reliance Electric's Tool Engineering Dept. has been built around the functional concept that there are three essential steps in the provision of a tool: Design, manufacture, and inspection. These steps follow the authorization for a tool, which may originate in the Process Engineering Dept. of any plant or in the Tool Engineering Dept. itself. The latter usually is the case when development of a new product or a special machine intended for a specialized processing operation is required. These three groups, and their particular responsibilities, are definite and clear cut.

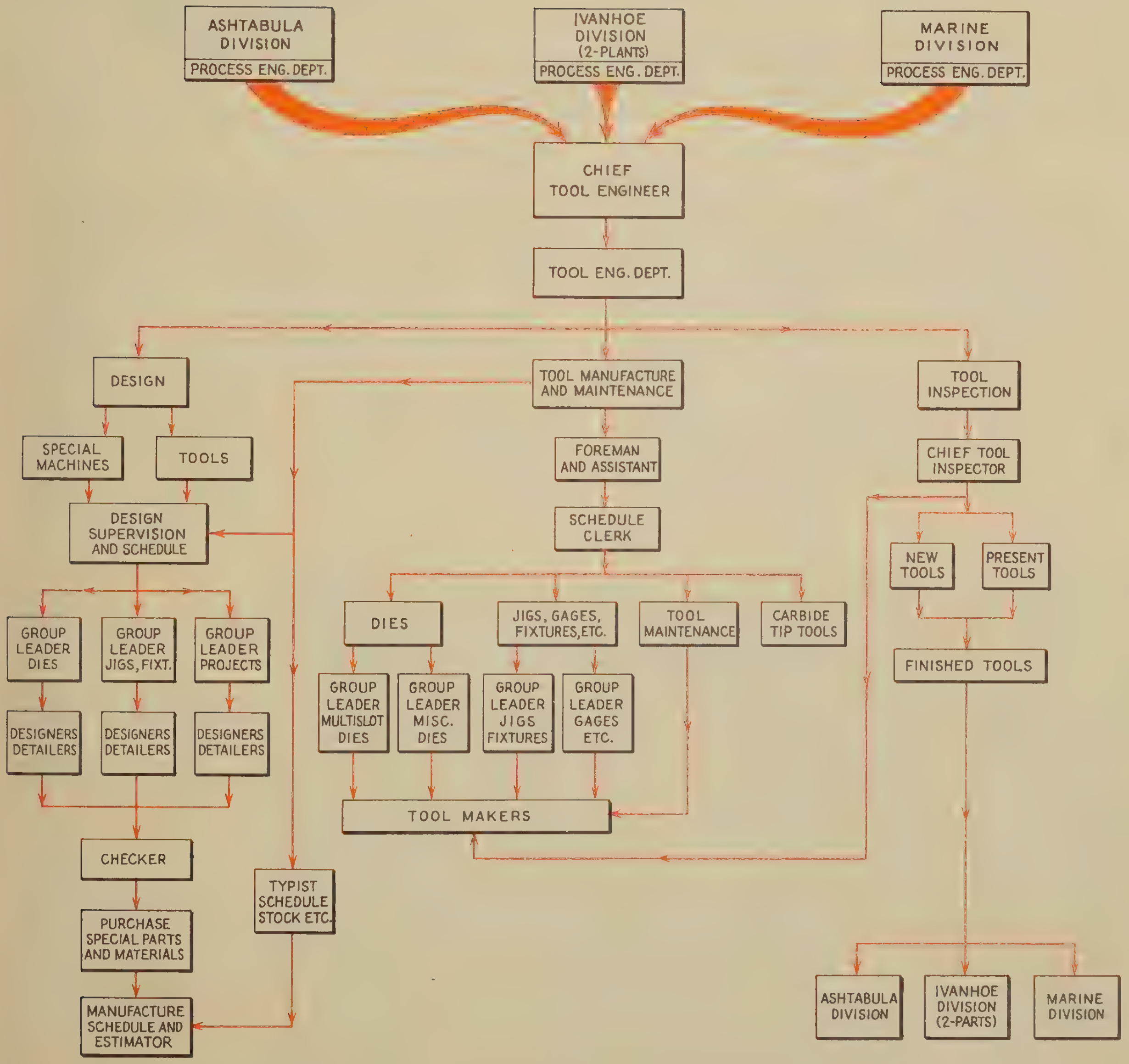
The tool design group, consisting of planning, design and recordkeeping sections, is responsible for meeting tool requirements imposed by new product developments and special motors; revising or replacing present or obsolete equipment; and providing new tools or special-purpose equipment.

The planning section of the tool design group estimates tool costs, prepares tooling programs, issues tooling schedules to engineer- and manufacturing departments, and provides final tool cost data on development orders. Setting up schedules covering design and procurement of materials and the manufacture of all tools are other planning functions. These schedules go to all interested departments so that they may plan and coordinate requirements accordingly.

Department

--Its Organization and Function

By FRANK S. DOBRIC
Chief Tool Engineer,
Reliance Electric & Engineering Co.,
Cleveland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TOOL ENG. DEPT.
DESIGN
TOOL MANUFACTURE AND MAINTENANCE
TOOL INSPECTION
SPECIAL MACHINES
TOOLS
FOREMAN AND ASSISTANT
CHIEF TOOL INSPECTOR
DESIGN SUPERVISION AND SCHEDULE
SCHEDULE CLERK
NEW TOOLS
PRESENT TOOLS
GROUP LEADER DIES
GROUP LEADER JIGS, FIXT.
GROUP LEADER PROJECTS
DIES
JIGS, GAGES, FIXTURES, ETC.
TOOL MAINTENANCE
CARBIDE TIP TOOLS
FINISHED TOOLS
GROUP LEADER MULTISLOT DIES
GROUP LEADER MISC. DIES
GROUP LEADER JIGS FIXTURES
GROUP LEADER GAGES ETC.
DESIGNERS DETAILERS
DESIGNERS DETAILERS
DESIGNERS DETAILERS
TOOL MAKERS
CHECKER
TYPIST SCHEDULE STOCK ETC.
PURCHASE SPECIAL PARTS AND MATERIALS
MANUFACTURE SCHEDULE AND ESTIMATOR
ASHTABULA DIVISION
IVANHOE DIVISION (2-PARTS)
MARINE DIVISION

FIG. 1 - The organization of the Tool Engineering Dept., is illustrated here, showing the individual groups in the department and their functions.

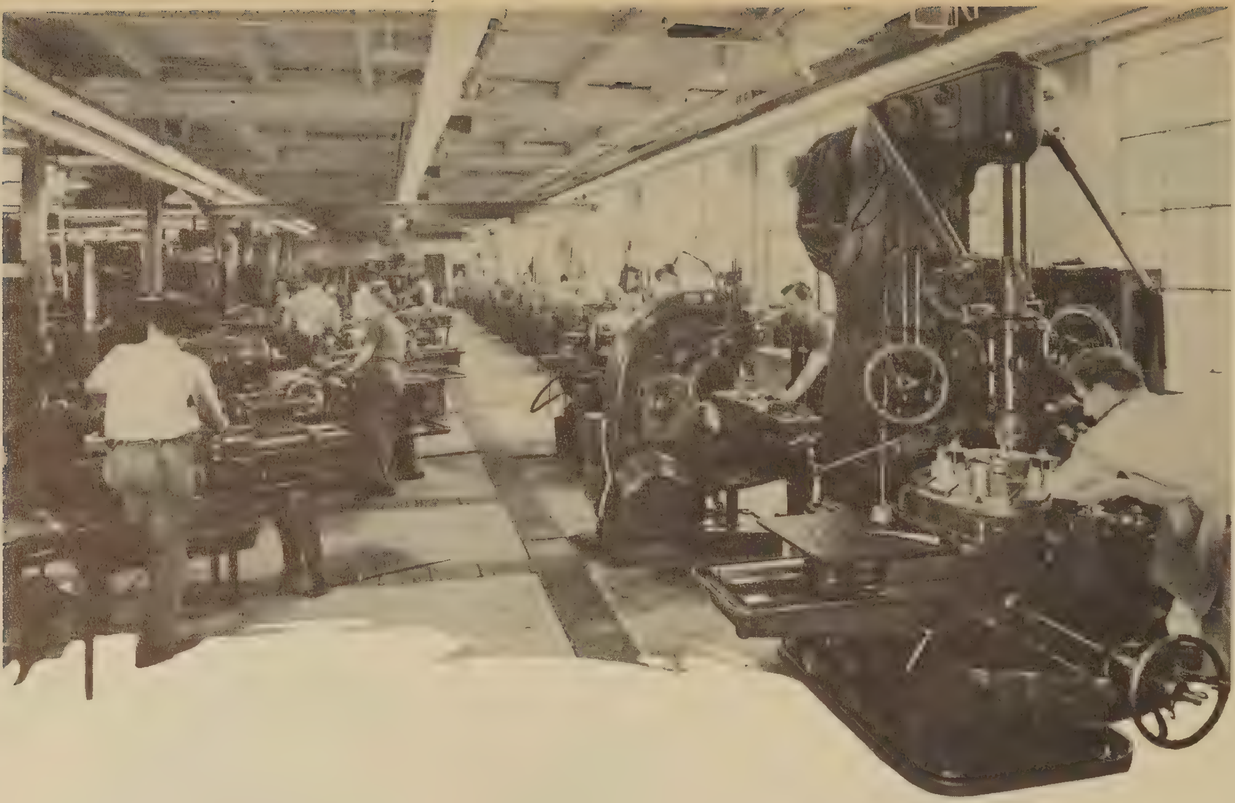

FIG. 2 - The tool room of the Tool Engineering Dept. is equipped with necessary machine tools and other metalworking equipment required to not only produce but maintain the tools used in the three divisions of the company.

The design section provides tool designs, and after completing and checking design details, furnishes planning with information required for ordering materials. Mechanical designs for special machinery and equipment are made by this group, and its mechanical design services as related to tools are available to other departments.

The recordkeeping section, as its name implies, maintains a complete file of all tool tracings; a card index of tools according to name, part number, etc.; and a journal of completed tool entries by motor frame size, providing a quick check that assures consecutive numerical assignment of new tools.

Through the utilization of these and supplementary forms, a tool follow-up and control procedure provides information on tools in process from the time the request is received until the finished tool is tested, inspected, delivered and installed.

Such a control system is vital at Reliance since (1) tools for the Company's Cleveland plants and new Ashtabula plant are handled by the one department, and (2) the time available for turning out these tools is necessarily short under normal conditions.

The tool manufacturing group concerns itself with the manufacture of all tools that Tool Engineering is called upon to produce, and with the maintenance of tool room equipment and tools provided for manufacturing.

In the order of importance, this work comprises three classifications: (1) Multiple-piercing, notching and other dies, for stator and rotor laminations and other stamped motor parts; (2) jigs, fixtures, gages, arbors, mandrels and templates used in connection with machining and winding operations; and (3) tool maintenance.

The tool room has 57 production-type machines, and includes electric and gas welders, a controlled atmosphere electric heat-treating furnace, drill presses, surface grinders, contour band saws, a 42-in. vertical turret lathe, tool room lathes, a jig borer and optical comparators. A view of this shop is shown in fig. 2.

Keeping tools in first class operating condition is important. Repairs take precedence over all other work when needed to keep production flowing smoothly. The tool room and tool crib staffs work hand in hand to maintain tools in good working order at all times.

The tool inspection group, as the name implies, concerns itself with checking and inspecting tools and tool room equipment. All types of tools purchased or produced by tool manufacturing are checked, and the precision devices available include gage blocks, angle gages, surface gages, dial bore gages, micrometers, verniers, optical and electrical comparators, hardness tester, a precision surface plate setup gage, parallels, angles and surface plates. Assisting in the initial setup and adjustment of the tool is also a function of the inspector. His responsibility does not end until the tool has been put into actual use.

To coordinate the product with production requirements and provide closer cooperation with Process Engineering, the Product and Tool Engineering Depts. have been consolidated into one expanded department, which is incorporated into the General Engineering Dept. Combining these two engineering functions and centralizing them at a single point was first tried during the war in the company's Marine Div., where both the Product and Tool Engineering Depts. functioned as one organization.

One of the first advantages of each organization was the closer tie-in achieved between personnel of the two departments. This permitted reviewing manufacturing problems in the design stage *before* production started. Modifications facilitating manufacture of improving the means of holding the work for machining could be introduced without delay.

This combination of Product with Tool Engineering also resulted in more efficient fabricating techniques and more economical tooling. Mutual problems confronting the Product Engineering, Tool Engineering and Process Engineering Depts. could, as a consequence, be solved at the drafting board stage rather than at the production stage.

Product design is realistically related to production equipment and processes. Proposals by Product Engineering are reviewed by Tool Engineering for specific changes or improvements that may save time or reduce costs; and every effort is made to anticipate difficulties that might arise in manufacture.

Distortion of work due to holding clamps, provisions for properly locating the tool or fixture on a machine, provisions for indexing, avoidance of special cutting tools wherever possible, provisions for adequate clearances of tools necessary in assembly operations, and the establishment of rational tolerances are typical problems considered in fitting production to available production equipment.

Where such practical difficulties are *solved in advance* of manufacture, costly delays are avoided and the confidence of assembly line operators in the engineering department and its work is stimulated.

The Tool Engineering Dept. maintains close liaison with the Manufacturing Dept. through a Process Engineering Dept. set up in each division with responsibility for routing and methods. Contact with these groups is regarded as important as that with the Product Engineering Dept.

In planning new tools for new products or special orders, Tool and Process Engineering personnel together determine the extent and type of tooling needed and the routing or processing of unusual or new parts. By considering these problems together, the need for future tooling alterations is either eliminated or reduced. Where circumstances dictate, the foreman of the department affected may be asked to sit in on the discussion to express his opinion as to the best way to make the part in question.

Because of its intimate contact with shop methods and production practices, the Process Engineering Dept. in each plant regularly submits suggestions for tool revisions to reduce cost, expedite handling, or improve product quality. These ideas frequently culminate in major tool improvements, and sometimes may radically change the method of fabricating a part.

A major function of Tool Engineering is to make certain that tools in process of manufacture are coordinated to meet production schedules. Through Process Engineering, Tool Engineering is advised of the quantities to be made on new developments. Where these data are not definite, an estimate is obtained directly from Production Control.

Knowledge of the work of the Standards Dept. likewise is important in developing new tools or special machinery. Job operational breakdowns are required to determine if new tools are economically justified. All elements of an operation, such as relative time required for handling and machining, are important when considering tools or parts, and when attempting to determine the most practical design in connection with the positioning of holding clamps and the location of other functional parts of the tool. These and related factors are added up and balanced against required quality, savings to be realized, and the

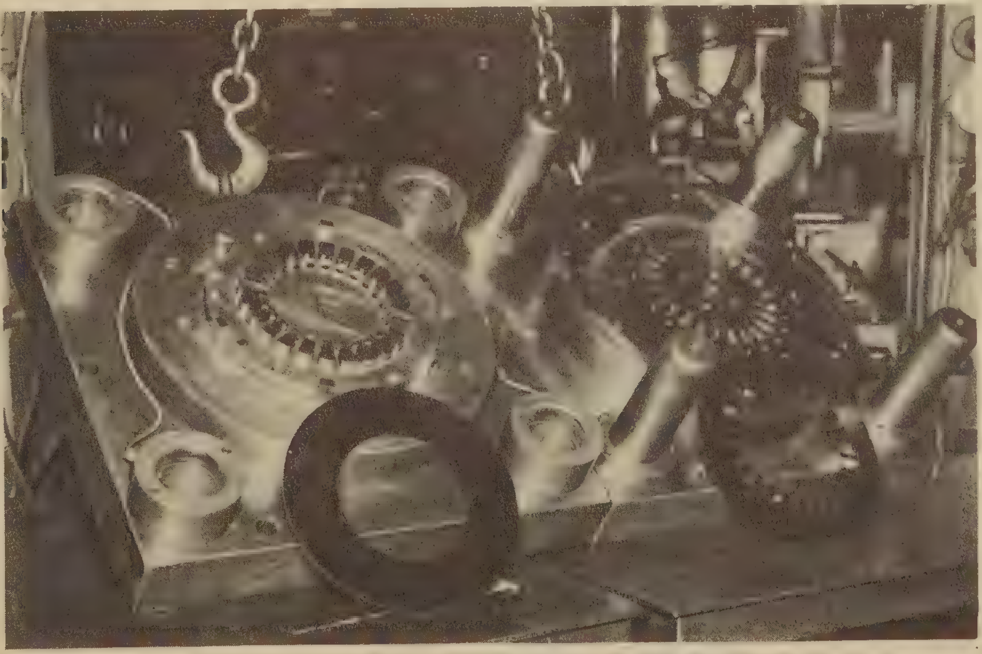

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FIG. 3 - Typical of the multiple-piercing dies is this one developed for punching out 24 slot stator laminations in a 100-ton Minister 45° inclined adjustable-speed press. Many inovations in multiple-piercing were developed by the Tool Engineering Dept.

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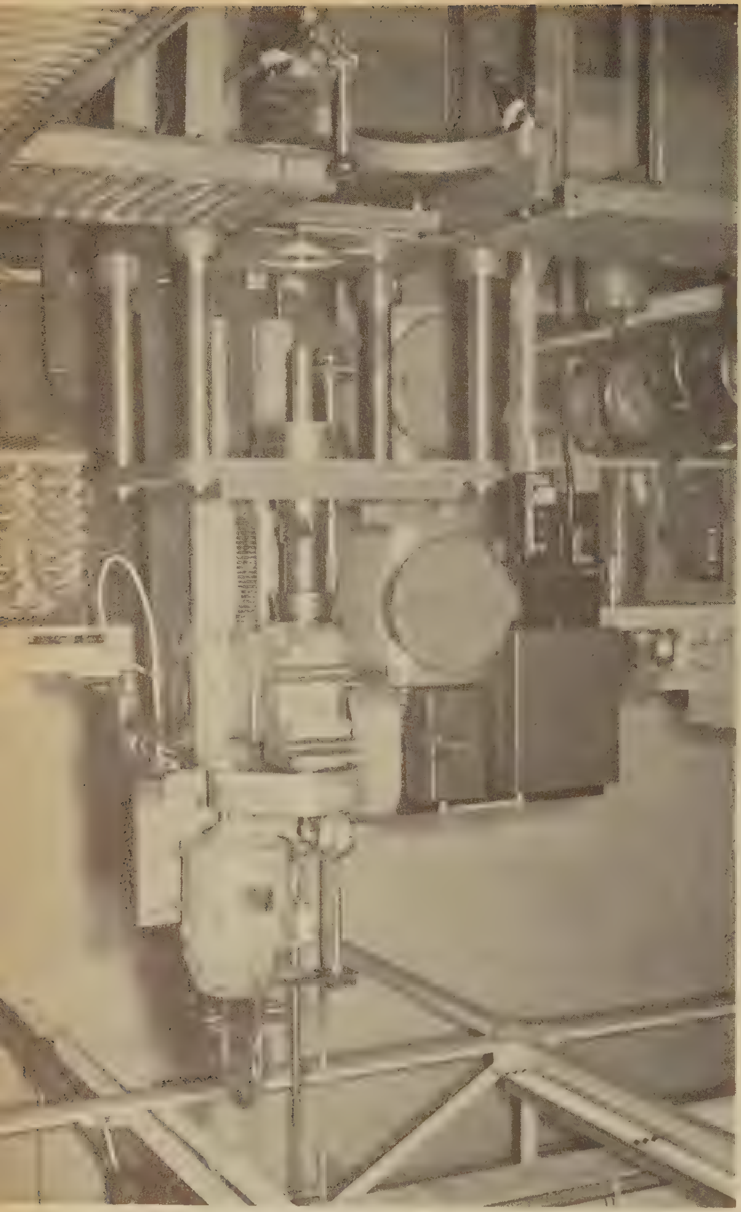


FIG. 4 - Boring stators of 1 to 20 hp motors was difficult until this machine was developed. It was built from a multiple-spindle drill press column, base and head, to which a precision boring spindle, a special feed motor and adjustable speed controls were added.

cost of the tool.

In addition to providing new tools and special machinery, the Tool Engineering Dept. advises and assists when there are contemplated changes in process and method. Its services include special duties affecting revisions in tooling design and setups, the manufacture of parts for experimental development, and the provision of special items urgently needed to most production demands. In effect, it serves as a production research organization.

Tool room equipment is available to meet special production needs. For example, for accurate drilling or boring, a tool room jig borer is used if the quantities involved do not warrant a production-line installation. Tool room personnel are available to check or correct tools on the job and to handle any work allied to tooling.

Once production of a certain type tool or special machine has been authorized, the design supervisor determines from his leading chart when the design can be scheduled and if the tool can be completed as quickly as wanted. If the date specified cannot be met, a check is made with Process Engineering to see if more time can be allowed. If not, some other job in process is set back; overtime is approved; or the job is subcontracted.

Whatever the action taken, the necessary information is recorded on forms that serve as work sheets for the tool designers. Distribution of design work and supervision of design is handled by the design supervisor through group leaders who obtain all required data and transmit them to the one or more tool designers working with him.

The completed design is checked for dimensions, approved, and routed to an estimator who computes the number of hours required to make the tool and schedules it for production. Factory orders for materials and supplies are made, and all job information and paper forms are transferred to the tool manufacturing group.

Tool production procedure is similar to tool design procedure. Group leaders, each specializing in certain phases of toolmaking, supervise and coordinate the work of the toolmakers. A special section engages solely in the manufacture of special carbide tipped tools. Completed tools, after approval of the Tool Inspection Dept., are shipped to the department from which the order originated.

From the extensive development work carried on by Reliance tool engineers during and since the war have come a number of special dies, fixtures and machines, that have contributed importantly to maintaining high productivity at low cost on a wide variety of motor-manufacturing operations. Among these are several that may be considered typical of the progress made in this direction.

Multiple-piercing dies for armature, stator and rotor laminations, such as shown in fig. 3, were instituted at Reliance in 1944, following an extensive survey of prevailing practices. The program embraced a dozen dies that incorporated the best of proved features and introduced innovations to take fullest advantage of available technical knowledge and production facilities.

Special features of the new dies included forced-feed oil-lubricated guide bushings, and special precision-made guide posts and bushings. The die is segmentally constructed, the segments of which are heat-treated high carbon-high chromium tool steel, accurately ground to shape and held in place by a shrink ring of the same material. Punches are made of the same material.

Methods of aligning punches with dies, the punch assembly and attachment to the punch holder were also developed. Punches, before assembly, are coated for 1 in. of their working end with a special synthetic resin that is equivalent in thickness to the clearance between punch and die. Punches are fastened in punch holder by individual screws and, with the retainer ring and plug assembled, a matrix material is used to lock them securely in place and maintain their initial alignment. This matrix material is a low melting point alloy having a negative coefficient of expansion. To allow for clearance adjustment to the die with punch length reduction resulting from wear, the punch retainer plate is laminated for 1 in. of its thickness. The synthetic resin coating is removed from punches during the die use.

In determining the economic justification for multi-slot dies, Reliance engineers figured on 5 million punchings for a 1 in. die life. Results to date surpass this figure, with the average die life exceeding 7,500,000 punchings and one die still in service after 11 million punchings.

The principal problem in providing an accurate air gap between the rotor and the stator of an ac motor is in controlling the bore of the stator relative to the bracket or end bell fit. A machine was designed and built solely for this operation. Using the base, head and column of a multiple-spindle drill press, a precision boring spindle with a special fixture and adapter for boring 1 to 20 hp motor stators was designed. This machine is semi-automatic in operation, requiring only loading and unloading by the operator.

The palletized stator is pushed into the fixture by loading rails, which locate it approximately over an adapter plate, shown in fig. 4. The operator then trips a lever, raising the hydraulically-powered platen on which one adapter plate is located. As the platen rises, the adapter-plate-stator-fit protrudes through the loading pallet so that the stator eventually is picked up and carried upward until its other fit is located in the top adapter plate, as shown in fig. 5.

The operator starts spindle and feed actions by pressing the control button of the Reliance variable speed drive. The boring spindle approaches the work on rapid traverse until it is in the work position, when a limit switch cuts the feed motor to low speed. When the stator is bored, the spindle stops, and the feed motor is reversed, returning the spindle to the starting position on rapid traverse. Speeds of the feed and spindle motors are independently controlled by rheostats through a range sufficiently wide to permit boring a number of different diameter stators. Speed indicators and a reference chart are used to establish the necessary speeds.

In boring a wound stator, dependable and effective chip removal is obtained by means of a special exhaust system consisting of a high-velocity centrifugal pump, filter tanks, and a collector or distribution chamber, integrally mounted in the boring machine base. Chip flow from the stator is directed by a hollow pilot bar with openings matching the intake holes in the boring head. The outboard pilot bar bearing in the base of the fixture services as the connection to the collector chamber.

Compact and direct, this arrangement requires no changes or adjustments for handling different size stators. Quick setup is accomplished with simple holding means and adjustable roughing and finishing tools. Mounted on the stator locating fixture is a tool setting gage which, together with pin gages, permits quick, accurate adjustment of tools for the various diameters without disturbing the setup. The simplified construction eliminates complicated baffles and piping without sacrificing efficiency. No secondary chip cleaning is required, as all chips are completely removed from the stator.

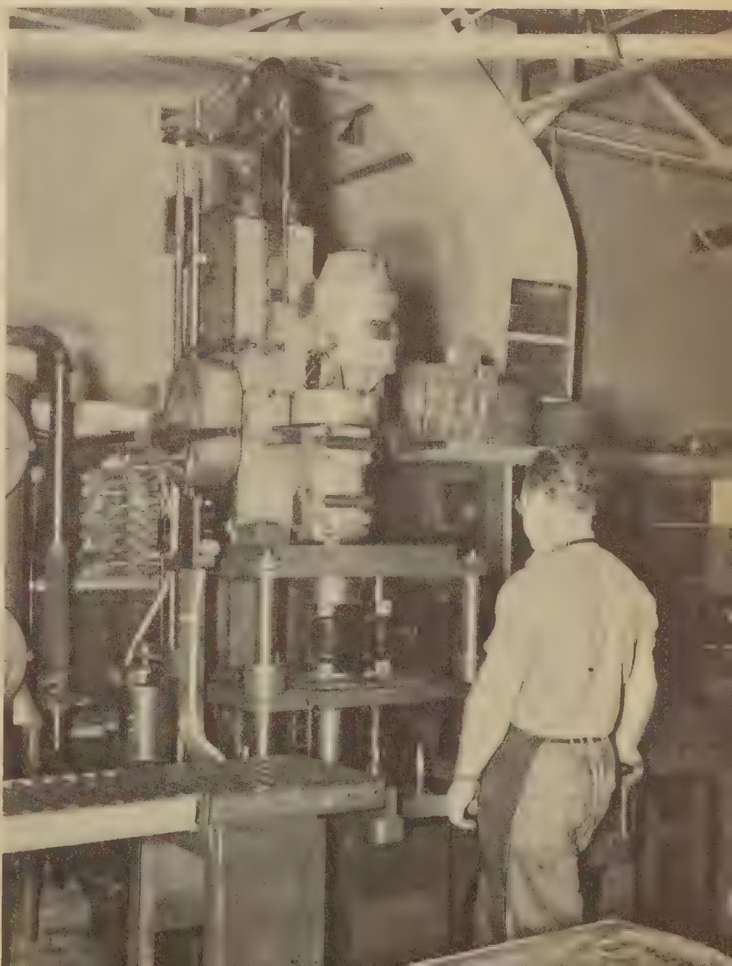
Indicative of the quick setup and fast operation obtained with this machine is the fact that the floor to floor time in boring a stator is less than 1 min. The operator loads the stators in the unit, pulls a lever, presses a push button, and the machine does the rest.

In addition to forming a part of the housing, a dc motor frame must support field and interpoles on its inner periphery. Accurate angular location of these poles in vital and many methods for drilling these parts, including the use of trunnion drill jigs with a radial or single spindle drill press, have been devised. This method is costly and necessitates frequent overhaul of equipment to maintain accuracies.

As an alternative, the eight-position radial drill shown in fig. 6 was built. This machine has individually motor-driven stations equally spaced around a specially fabricated frame. An adjustable-speed drive, the company's own V-S system, permits individual adjustment of speed and feed of any drill spindle by rheostats.

The radial movement of the drill heads, coupled with a simple adapter plate, permits handling different frame sizes. With uniform axial spacing of the field and inter-pole mounting holes, a 45° index is needed to drill 16 holes. If spacing is not uniform, a 90° index is required. A bar clamp secures the work and overall design

FIG. 5 - The stator boring machine receives the stator over an adapter on a platen, which is hydraulically raised until the stator fit of the adapter plate protrudes through the loading pallet and its top fit is located in the top of an adapter plate.



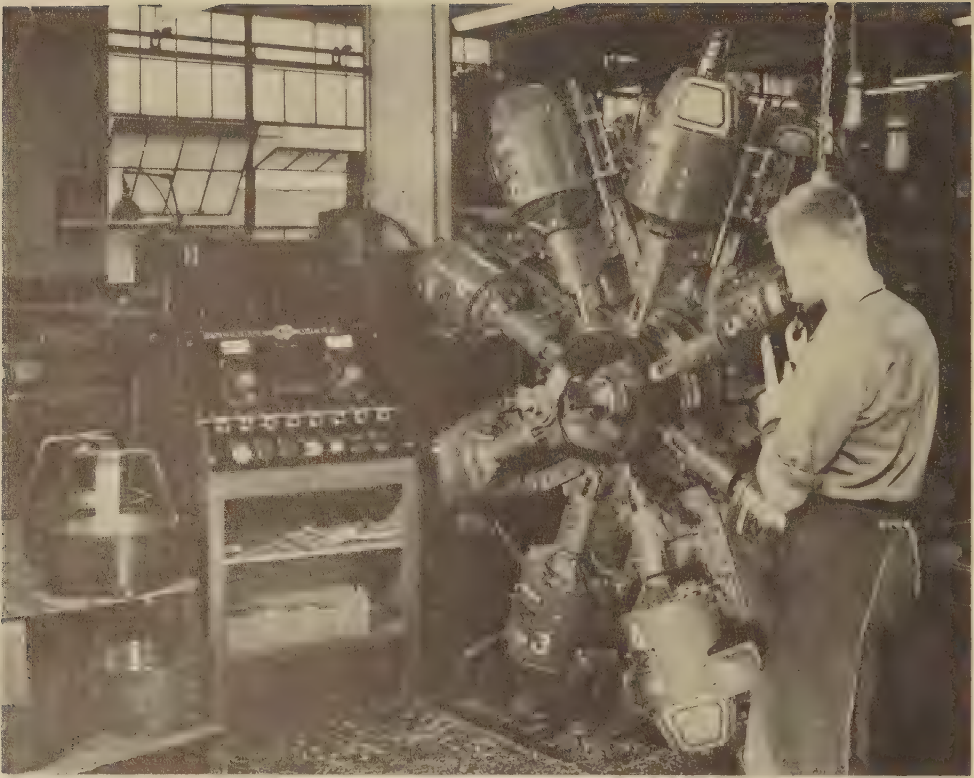


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FIG. 6 - This eight-head radial drill is a special-purpose machine designed and developed at Reliance. It has eight individually motor-driven stations for accurately drilling simultaneously as many sets of holes used to anchor field poles in frames of dc motors.

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of the equipment simplifies loading and drilling.

Designed by Reliance tool engineers, a hairpin coil winding machine winds wire on edge to form both single turn hairpin coils and loop coils of either single or parallel conductors. Called a *table top winder* because it is designed with a flat top, the unit comprises a wire reel holder, winding mandrel, and cutoff shear.

The winding mandrel is adjustable to suit the size and number of wires in parallel. A guide holds the wire in place as the forming roll winds it around a mandrel. To prevent buckling because of the small radius of the corner turn, the wire is clamped on the flat side as the forming roll starts to rotate. Close guiding, clamping action and roll forming produce a well-shaped coil without damaging the insulation.

The first coil is made by pulling the wires just beyond the foot operated, air-powered cutoff shear to trim the ends. Cutting actuates an interlock valve to start the winding mandrel in motion. Subsequent coils are made in the same manner except that the gage point is far enough beyond the cutoff shear to make a coil of the required length.

For loop coils, the first step is to make hairpins, which are then reprocessed, forming first one leg and then the other, until a complete loop coil is obtained. Adjusting for loop coil length variation, compensating for wire spring-back, and means for removing the coil from the mandrel are all provided. The machine has more than doubled output over previous methods.

Nearing completion is a horizontal drilling machine for multiple-spindle drilling the bracket mounting and foot holes in frames and mounting holes in brackets of 20 to 500 hp ac and dc motors. This machine is being converted from a special-purpose horizontal multiple-drill press to a fixed 98-spindle unit arranged to provide 16 different bolt holes and an equal number of locating positions.

In addition, there are 13 different rectangular hole arrangements for drilling motor frame feet and a corresponding number of locating pin positions. Special liners in the drill jib permit the use of either tap or clearance drill sizes in all of the drill positions. Drill bushings and locating pin holes are distributed to provide the best arrangement consistent with strength and utility.

Drilling of different parts and different sized holes becomes a matter of choosing the correct locator pin positions, and then inserting the proper drill bushings in the drill jig and drills in the cluster spindles. Templates or other simple setup arrangements will be used to determine locator pin and drill positions. The quick setup time and short drilling operation are expected to make this machine ideal for handling many different motor sizes.

A checking plate, usable on both ac or dc motors, including all of the enclosure types, quickly establishes whether various motor dimensions satisfy specifications. The fixture is shown in fig. 7.

As designed, the fixture checks motor feet hole spacing, hole size, the relation of holes to motor center line and shaft shoulder, center height, motor shaft runout, parallelism of shaft to plane,

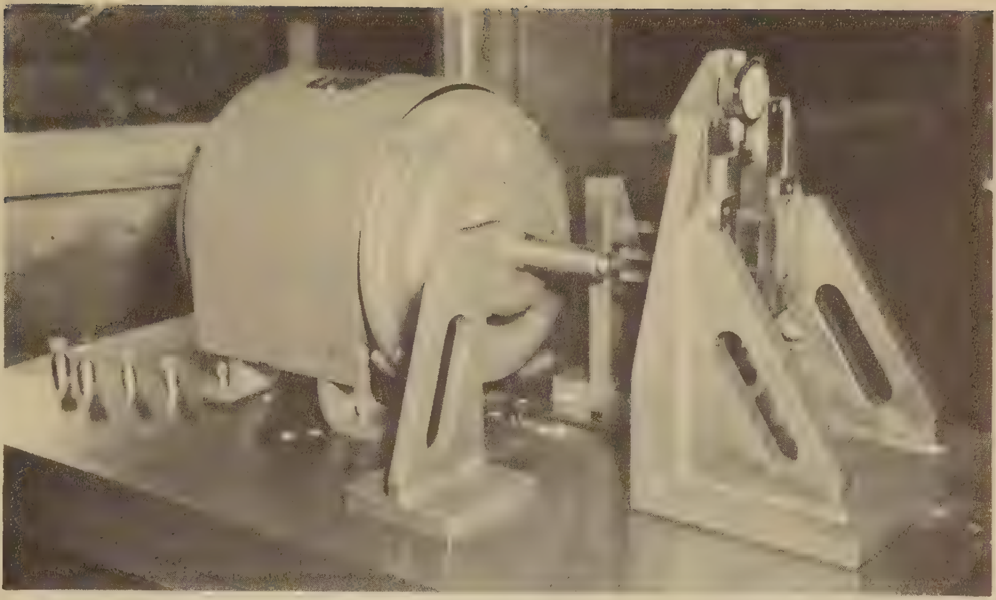

FIG. 7 - This novel fixture was developed to check 1 to 20 hp motors for NEMA-recommended mounting dimensions.

and planity of feet. These inspections which insure that Reliance motors meet established standards of quality and conform to NEMA-recommended mounting dimensions, are accomplished in the one fixture through the use of two angle plates and a surface plate.

Extensive as the foregoing developments may appear to be, there are a number of others currently under way or scheduled for early launching. They concern improvements in field pole and commutator manufacture, further economies in die manufacture, miscellaneous coil winding projects and the development of a number of new fixtures.

Novel Billet Descaler Aids Forging

DESCALING heated round billets in the forge shop of International Harvester Co., Ft. Wayne, Ind., is accomplished by means of a simple, motor-driven machine shown in the accompanying illustration. The heated bar, laid on a pair of motor-driven rollers, is rotated by friction in contact with the knurled roller and with knives that are set in a pivoted frame to bear against the surface to be descaled. Pressure is applied to the billet by a third roller having bearings in the hinged knife frame. An end knife serves both as a stop and to remove the scale from the end of the billet.

Furnace men, handling the billets with tongs, do the descaling before passing the billets on to the hammermen. Scale removal helps make cleaner forgings and prolongs die life.

As originally designed, the machine was equipped with a foot pedal to move the knives against the billet and to apply pressure to the upper roller. A counterweight was provided to lift the knives and the frame after descaling. It was found better, however, to use an air cylinder with a pedal-operated valve to actuate the knife frame.

The knife blades are set so that they can move longitudinally against a light coil spring which limits the maximum pressure applied to the knives and moves them against a stop when they are out of contact with the billet. The springs also compensate for surface irregularities in the billets.

Rollers that support the billet are rotated by gears with 3-in. pitch diameter, meshing with a 2-in. pinion. The pinion is driven by a gear reducer providing a 16⅔ to 1 reduction. The reducer is driven by a 1 hp motor turning at 1140 rpm.

Descaling is effective and done so quickly that there is relatively little loss of heat in the billet. The scale, as it is removed from the billet, drops to the floor.

This roller-driven descaling machine is a simple mechanical means of removing scale from billets prior to forging. Roll pressure and knives accomplish the descaling, with little heat loss in the billet.

Automatic Welding of Steel

The use of automatic welding to build up worn surfaces such as roll journals, piston head rods, the body and journals of mill roller tables, and crane wheel assemblies, as well as for repairing broken parts has saved Carnegie-Illinois Steel Corp. considerable sums of money. The equipment, metallurgical and mechanical aspects, and examples of work done by this technique are described in this article.*

A SOURCE of great expense in machinery maintenance is wear, and in steel plants wear is often aggravated by flying scale, dirt laden atmospheres and temperatures that tend to reduce the effectiveness of lubricants. Replacement of worn parts of heavy equipment is particularly troublesome because of the original cost of item and because the amount of metal lost through wear is small in comparison with the whole.

Automatic, flux-covered arc welding and rugged equipment with flexible operational characteristics is an important tool for rebuildnig and replacing metal worn away from steel mill equipment. Carnegie-Illinois Steel Corp., at Homestead, Pa., uses automatic welding to recondition heavy rotating steel mill equipment, such as rolls, table rollers, spindles, and other equipment.

The welding installation was set up in 1944, and was designed to permit unlimited surface coverage of approximately round items having diameters from 4 to 60 in. and lengths up to 22½ ft when the work is carried on centers. Greater lengths are accommodated by using steady rests.

A 30-year old, 63-in., Bement-Miles lathe rotates the work, laterally moves the welding head, and supports the work and other equipment. Adequate rotational speed regulation, i.e., an incremented range of from 15 to 50 peripheral ipm for work of any diameter from 4 to 60 in., is provided. A 16:1 gear reducer was inserted between the 400 to 1600 rpm dc motor and the lathe gear train. A clutch in the lathe gear train furnishes four ratios in the approximate relation 1, 4, 16 and 64. Thus an overall ratio of 256:1 is established.

Work is supported either by the lathe centers or by bronze carrier bearings supported by the lathe bed. The latter is used for the heavier work. To accommodate longitudinal expansion and contraction of the work caused by temperature changes during welding, the tailstock gearing by which the center is advanced was modified. A 10,000 lb, railroad car type compression spring was inserted between a shoulder on the tailstock screw shaft and the rear of the housing. The rear of the spring is separated from the housing by a disk type antifraction bearing. The part of the screw shaft emerging from the rear of the housing is splined and keyed for a sliding gear fit. This permits a limited independent horizontal movement of the tailstock center by compression of the spring. Spring compression, translated into 1000 lb increments of force, is indicated by a pointer and gage.

Items weighing over 10 tons are rotated on bronze carrier bearings, each bearing resting

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* *"Flux Covered Arc Welding of Heavy Machinery Equipment," a paper upon which this article is based, was awarded the first prize under the classificational awards for maintenance in the Design For Progress contest sponsored by the James F. Lincoln Arc Welding Award Foundation.*

Mill Equipment

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on a heavy structural beam laid across the lathe bed. For rolls weighing over 50 tons, the procedure has been to preheat them in a furnace to 600°F, and set them in 80-10-10 (copper, tin, lead) bearings. Using a high temperature lubricating grease, no difficulty has been experienced in rotating these heavy rolls.

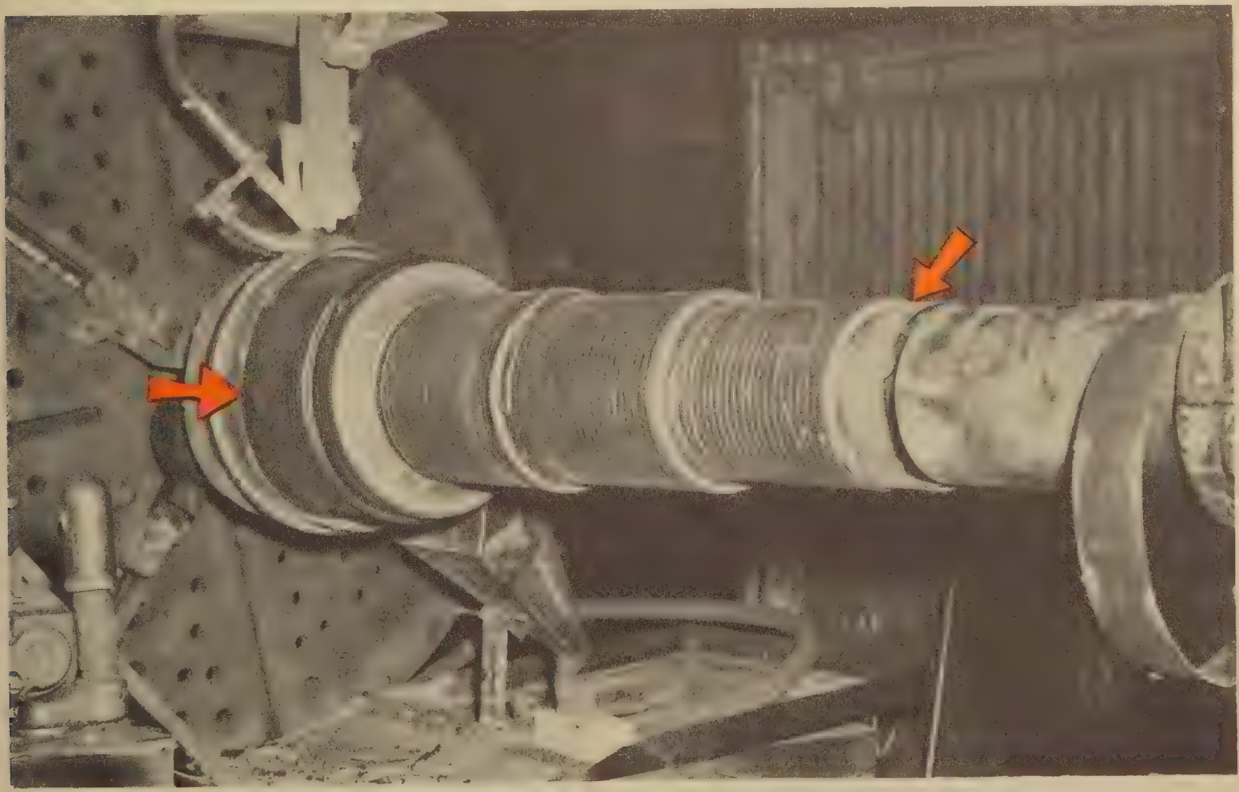
The three welding machines are beyond the head end of the lathe. All control and power cables and a compressed air line are looped and supported by the trolley track secured to an overhead platform. A platform, approached by stairs, provides access to the electrode, the electrode reels, and the flux vacuum separator tank. The welding head, master control panel, flux hopper with vibrator attached, wire reels, vacuum separator tank, descaling hammer, vacuum pump and motor and a flux chute are all supported directly or indirectly by the lathe carriage.

The air outlet hose from the vacuum separator tank is connected to the vacuum pump mounted on the carriage. The inlet hose is connected to a flux chute which may be positioned on the opposite side of the carriage as desired to catch, screen, and direct excess unfused flux into the air stream.

Flux is directed to the work through a 2 in. pipe cock, a length of rubber hose and a short length of 1-in. non-magnetic stainless steel tubing supported by an insulated arm. The exit end of the tube, directed toward the contact jaws, is an opening about 3/8 in. wide by 1-in. high, approximately parallel to and separated from the closest jaw by about 1/8 in. The bottom of the tube is about 3/4 in. below the ends of the jaws. Flux flow is controlled by the damming action of the work so that the higher the head is positioned, the greater the discharge. The hopper vibrator helps assure a continual flow.

The welding head gear case and motor are thermally shielded by a composition board about 15x15 in. inserted between the gear case and the wire guide extension arm. Further protection

FIG. 1 - This plate mill oscillating head shear eccentric was welded by the automatic welding method. Metal bands are used to laterally support the flux when welding is near the edge of a surface.



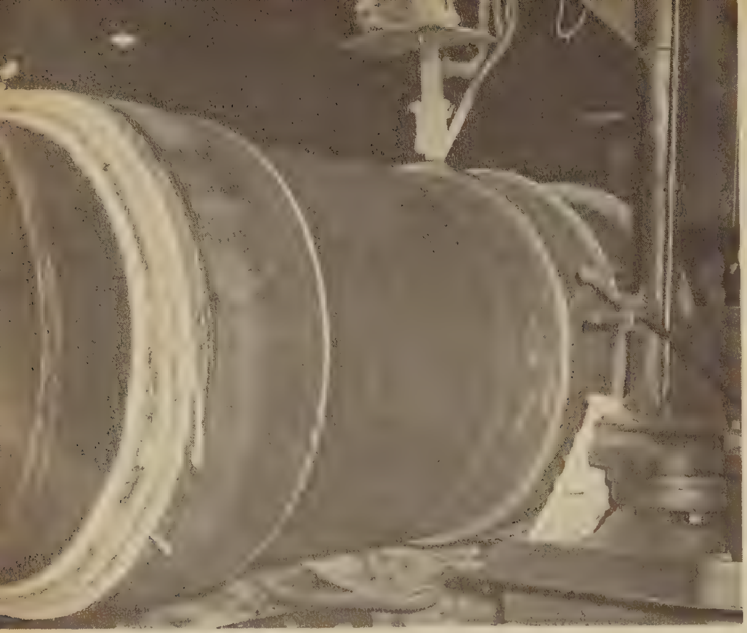


FIG. 2 - Asbestos braid is also used to support flux when welding near edges of a surface. This is the same eccentric shown in fig. 1.

is assured by directing fine compressed air streams against the case.

All three welding machines are started and stopped simultaneously by single push button control. A paralleling switch makes it possible to cut out one of the machines for low amperage work.

Gas burners for preheating, maintaining temperatures and post-heating are set at the rear of the lathe, and directed so the flames impinge upon the work near the bottom. Asbestos board baffles are frequently used to retard heat loss. Sections are simply set on the top of the lathe bed and allowed to rest against the work wherever possible.

Operational features and metallurgical aspects of this process are: (1) Continuously supporting a pool of molten metal and slag, completely covered by a mound of granular flux, at the apex of a revolving cylindrical surface. (2) The necessity for complete fusion bonding of the solidifying metal not only with the underlying metal but with the adjacent deposited metal. (3) The necessity for adequate stress control from the time heat is first applied to the work until it has cooled to atmospheric temperature. (4) The economic advantage of depositing metal as fast as practical.

Controls must be coordinated to keep molten metal and slag from spilling down either side of the work. The size of the obscured pool (chiefly a function of amperage); the position of the arc with respect to the apex of the work; and the rate of movement, are the main variables. The larger the diameter of work, the greater is the latitude in the selection of settings.

As diameter size is decreased the amperage must be correspondingly decreased to the extent that no more than about 500 amp may be used with an 8 in. diam item. More attention must be given to the location of the welding head so that the arc pool is carried from 1 to 2 in. ahead of the apex on the ascending side. Rotating speed must be increased to obtain a smaller and more quickly solidifying pool. As the amperage is reduced and a correspondingly smaller bead deposited, the pitch of the lead screw must be decreased to eliminate valleys between successive beads.

Near the lower diameter limit, excessive heating of the work sometimes makes it necessary to stop welding for short intervals. Also, the slag on the ascending bead must be removed while still red and viscous, sometimes difficult even with an efficient pneumatic hammer.

The most desirable bead is relatively flat and wide, tapering gradually to the base metal. This bead, combined with the proper lead, assures a flat, efficient, contniuous contour of applied metal. With a high, undercut edged bead, slag may be trapped that may not be released by refusion on the next revolution unless the carriage is set for a disproportionately small pitch. Pitch range is from ¼ to ¾ in. depending upon amperage.

Bead contour is controlled mainly by arc voltage; the higher the voltage the less its curvature. Arc voltage selection ranges from about 28 to 42 v in approximate proportion to the amperage delivered. Increasing the rotational speed thins and narrows the bead. On larger diameters where metal spillage is not a factor, there is latitude in permissable speed variation. The upper limit is indicated by adherence of the electrode to the work because the heat input is insufficient to keep pace with the advancing work in maintaining a molten pool. The usual peripheral speed is in the range 15 to 45 ipm. The rate of electrode deposition is practically an exclusive function of amperage and polarity, and is not affected by rate of speed of the work, bead contour, pitch of the bead, etc.

Straight polarity is mainly employed since it gives approximately 30 pct greater burn-off rate. Exceptions are made where surface irregularities indicate the advisability of additional penetration on the first or second passes. Excessive oxidation of the surface to be welded may cause some porosity in the first pass, but this condition is corrected by using reverse polarity on the second pass.

When welding near the edge of a surface with an abrupt drop of more than 1 in., flux must be supported laterally. Sheet metal bands or braided asbestos rope can be used. Metal bands may be seen in fig. 1, showing welding of the several surfaces of a plate mill shear eccentric. These bands are generally curved to a diameter slightly smaller than that of the surface to be welded, and are tack welded in position abutting the vertical face of the preheated work.

When braided asbestos rope supports the flux it is wound around a smaller diameter adjacent surface until the required elevation is obtained. Fig. 2 shows this practice in welding a 54-in. blooming mill roll.

Abrupt depressions, such as deep keyways, are brought up to the approximate elevation of the surface to be welded by inserting steel blocks in the recesses. When the weld is to be limited to one or two passes, these blocks are chamfered on the bottom at one end so they may be removed by wedging. This shears the deposited metal along the contour of the keyway thereby preserving it.

Slag is gathered and crushed for re-use, but the second fusion product is discarded. There appears to be practically no disadvantage in re-using this material. Only once or twice, while welding work of small diameter, has any difference been noted, and this was a tendency of the slag to run. The weld, however, appeared sound but ragged.

An analysis made of new and once-used flux, showed the composition is appreciably altered by use. Manganese lost through alloying with the weld and the increase in FeO content indicate a loss of deoxidizing power and make it apparent that performance is sacrificed by re-using flux. Re-use could not be repeated indefinitely without objectionable effects, such as abnormal carbon depletion in the weld. Equipment is being provided for mixing a fixed ratio of new and used material to stabilize the composition. Proportioned mixing should minimize objectional characteristics for any particular percentage of reclamation established.

Because welding provides an opportunity, through appropriate electrode selection, to enhance wear resistance, the fact may be ignored that such equipment as is here considered is engineered primarily to transmit power economically, and that any sacrifice in strength implies encroachment on the factor of safety inherent in the design. Harder, more wear resistant deposits have a tendency to do just this largely because they introduce higher degrees of stress. However, unless an item is of a highly specialized character, it is usually possible, by suitable thermal manipulation, to reconcile these somewhat opposing tendencies so that performance is equal to or superior to that originally experienced.

As long as momentary expensional tendencies attending the allotropic transformation of iron occur in the upper transformation range there is probably no affect, except as the specific temperature of the occurrence influences the physical properties of the metal.

The effect of increasing band thickness is to lower its unit stress slightly because the cylinder will compress slightly as the total forces exerted by the band increase. This relief is minor and when considering multiple pass deposits its effect is of little importance in comparison with the potential of the total forces confined in heavv deposits. When one or two passes are used, high stresses, even to the extent of surface cracking of the deposit, may be tolerated. However, if more and more passes are laid down, eventually not only will the weld crack but the underlying metal may be literally torn apart.

This analysis ignores significant differences which complete the consideration of multiple pass welds. Nevertheless, it is useful in portraying the fundamental concept. Experience indicates, that other things being equal, large additions of metal are more critical and require more

MACROETCH. 2X ACTUAL SIZE.
SECTION OF MULTIPLE PASS WELD USING LINCOLNWELD ELECTRODE
X-1837 ON CAST ALLOY STEEL BASE.

	C	MN	SI	CR	MO	W	NI	V
CAST STEEL BASE	0.79	0.65	0.32	0.85	0.42	-	0.10	0.02
1ST PASS. L-60 ELECTRODE	0.15	0.20	0.03	-	-	-	-	-
SUBSEQUENT PASSES X-1837 ELECTRODE	0.35	0.35	1.00	5.00	-	1.35	-	-

BASE PREHEATED TO 400 F FOR WELDING.

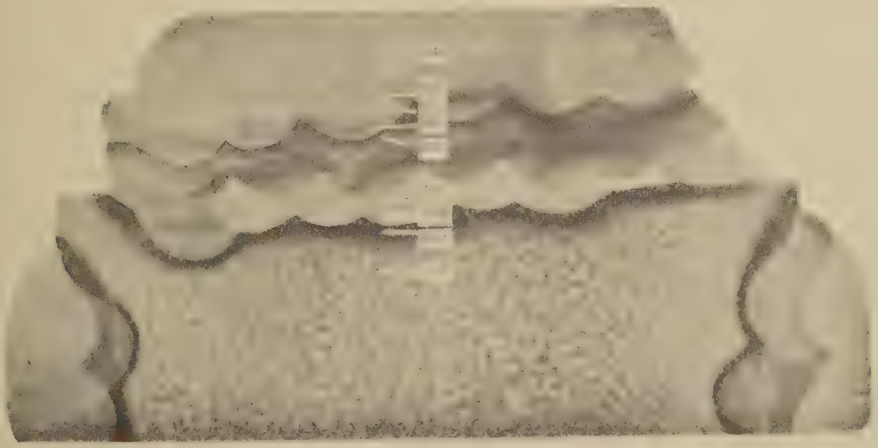
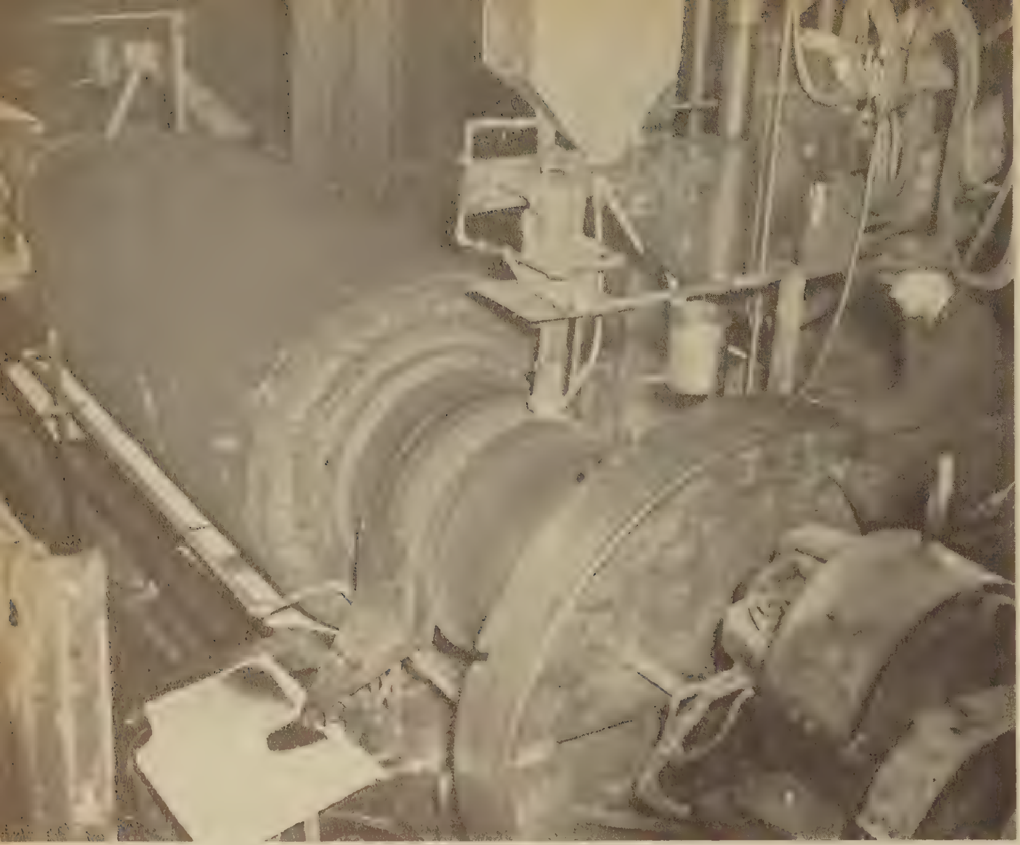


FIG. 3 - Firth hardness readings taken every 0.040 in. from the approximate center of the last welding pass into the base metal. A low carbon electrode was used over most of the surface of the high carbon alloy base on the first pass. A high alloy, medium carbon electrode was used at the ends of the section and on the successive passes over the low carbon electrode.

FIRTH HARDNESS
SPACED AT 0.040 IN.

1	549
2	521
3	549
4	521
5	521
6	521
7	521
8	521
9	470
10	470
11	470
12	470
13	470
14	470
15	470
16	209
17	209
18	301
19	278
20	249
21	202
22	216
23	189
24	202



° ° °

FIG. 4 - The journals of this cast alloy steel backup roll for a 100-in. semi-continuous plate mill were built up by welding. Rolls weigh 90,000 lb, have a journal diameter of 31 in., a roll diameter of 54½ in., and a length of 18 ft 4 in.

° ° °

consideration than do one or two pass deposits.

The other factor determining whether rupture actually occurs is the capacity of the metal to withstand stress. This is more accurately portrayed as essentially its capacity to dissipate stress or minimize its progression within the range of temperature development. Room temperature strength, such as is indicated by the yield value in a tensile specimen, while high, is relatively less important or at least inadequate in this respect.

In general, the lower the carbon and alloy content of the weld the greater its capacity to dissipate stress and consequently the less the significance of controlled heat. If the carbon is held low, a moderate alloy addition may be tolerated under like conditions with some improvement in hardness.

In contemplating more wear resistant deposits, the use of carbide forming elements such as vanadium, chromium, tungsten and molybdenum is indicated for two reasons: 1—Because of the formation of microscopic hard carbides, greater wear resistance is evident at any particular level of hardness; 2—Once formed, these carbides tend to remain advantageously dispersed by resisting re-solution at comparatively high temperatures. Thus, optimum carbide dispersion is largely retained at temperatures favoring a substantial degree of stress dissipation by means of plastic flow of the softer, predominately iron matrix. Herein lies the opportunity to improve the serviceability of items subject to wear.

It would seem that for maximum benefits, electrode composition should be balanced to give as high a carbon content in the weld as is practical, possibly 0.30 to 0.50 pct, together with proportions of carbide forming elements that would practically insure both beginning and end of transformation in the lower portion of the upper transformation range (somewhat above 600°F) at the cooling rates established by the process. Transformation has been purposely regulated to the upper range because, it is believed, the extremely hard, non-machinable deposits are not generally indicated for most applications herein considered and also because they are too highly stressed. There are exceptions where relatively shallow deposits of this type may be used on certain types of equipment.

Specific preheating temperatures must be considered not only in relation to the process but in conformity with practical dictates such as implied by the necessity of continuously supporting large revolving masses. Post-heating temperatures are almost unlimited except perhaps by distortion considerations. The mere application of heat to some items may cause slight movement by releasing stresses already present.

The nature of the surface of the base metal and that the deposit should be considered also. Cracks or spalls in the base metal before welding are sources of crack propagation and should be removed unless it is definitely known that they are sufficiently shallow and stress free to insure removal by fusion of the first pass. Exaggerated valleys between successive beads resulting from improper bead contour or too great a pitch of the carriage screw are in the same category.

Fig. 3, a macroetch of a multiple pass weld, illustrates several points. A straight low carbon electrode was used over most of the surface of the high carbon alloy base on the first pass. At the ends of the section a medium carbon rather high alloy composition was used. Successive passes were made with this electrode. Close inspection showed at least one fine internal crack in the first layer of alloy metal near the left

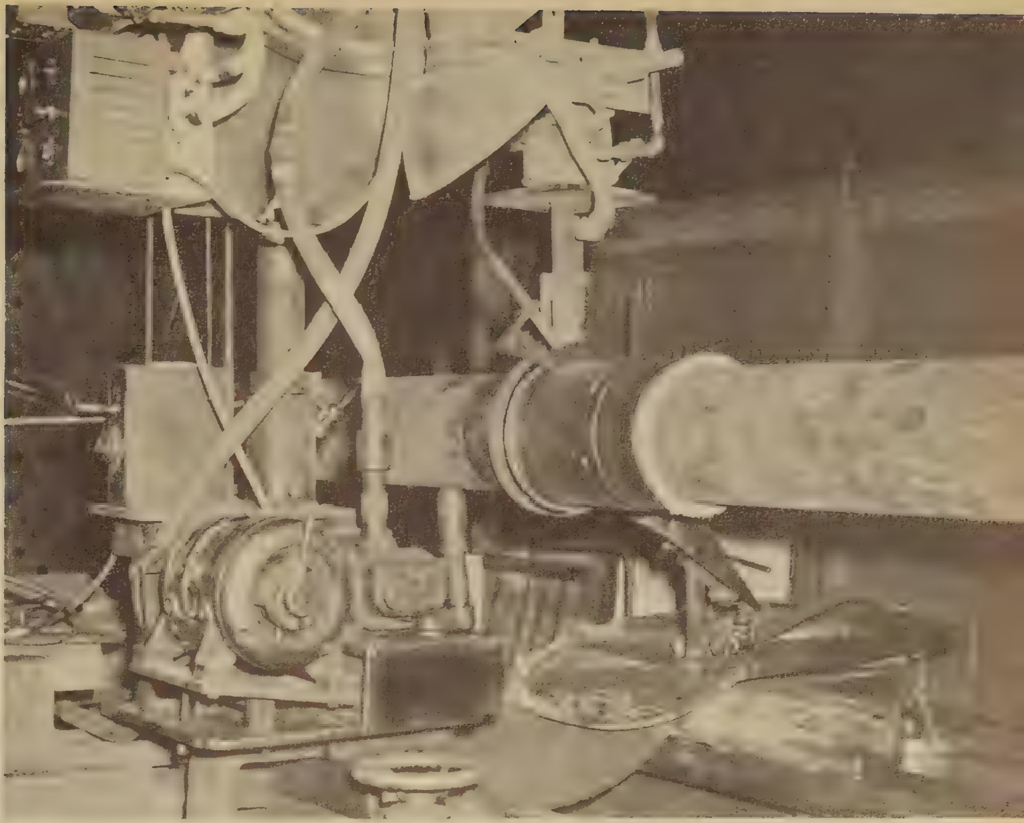


FIG. 5 - This hollow forged steel piston rod for a blast furnace blowing engine was welded to the piston head.

edge. This occurred despite preheating of the base metal to 400°F. No cracks are visible in any portion of the alloy weld above the bead obtained with the low carbon electrode. It can be assumed that the crack developed as the result of the additional carbon and alloy introduced into this first alloy pass by the base metal at this low preheat temperature. The function of the low carbon electrode in providing a buffer pass will be appreciated.

The hardness penetration figures included in this photograph show the high hardness possible with this electrode when preheat temperature is held low. It might be noted that, inasmuch as these beads were deposited upon a bar rather than around a cylinder, some deflectional stress relief may have assisted in preventing more extensive cracking.

Illustrations of this method of welding described in the following data are confined to items welded with electrodes producing deposits of moderate hardness. Such electrodes are practical and suitable for most work; are least expensive; and can be applied with comparative ease and safety. More recent experiments with deposits from electrodes giving higher values assure that, properly controlled, they are equally practical and even more serviceable.

Lincolnweld L-60, L-70 and L-201 electrodes were used exclusively for the work described in this article. Electrodes ranged in size from ⅛ to 7/32 in. diam, depending upon the burn-off rate in accord with the speed of delivery possible within the range of the head motor. Deposition rates increase from about 0.3 lb per min at 500 amp to nearly 1 lb per min at 1200 amp, using straight polarity.

Investigation of deposits using new flux has indicated that there is a pick-up of manganese, possibly in the range 0.5 to 1 pct. There is a slight loss in carbon apparently in approximate proportion to its total content in the pool. This is also evident for some alloys such as chromium, but to a lesser degree. As the electrode is deposited, bead composition is a composite of the underlying metal and the electrode. When welding work of high carbon content with or without alloy, it appears advisable to use a low carbon electrode, such as L-60, on the first pass to bring bead composition more in line with subsequent passes.

With respect to the consideration of stress control, experience has showed that no visible ruptures have occurred from occasionally welding low or medium carbon items without preheat using low carbon or low carbon alloy electrode. Nevertheless, even with these mild electrodes, preheating seems to provide a margin of safety well worth the additional expense. This is particularly applicable if the items are quite large, highly stressed in service and the deposit is extensive. If the base metal is an alloy forging or a high carbon grade such control is unquestionably indicated. This also applies in using electrodes with carbon and alloy contents significantly in excess of those represented by electrodes L-60 and L-70, such as L-201.

Specific temperatures should be considered in relation to other factors. All of the rolls illustrated were preheated to 600°F and postheated at 700°F in a furnace. Most of the other items were preheated and postheated in the lathe at 400°F to 300°F. The rate of heat input at the comparatively high amperages delivered by automatic equipment often is sufficient to provide all control necessary. This applies specifically to items of small mass or where a multiple pass deposit of relatively short length is contemplated.

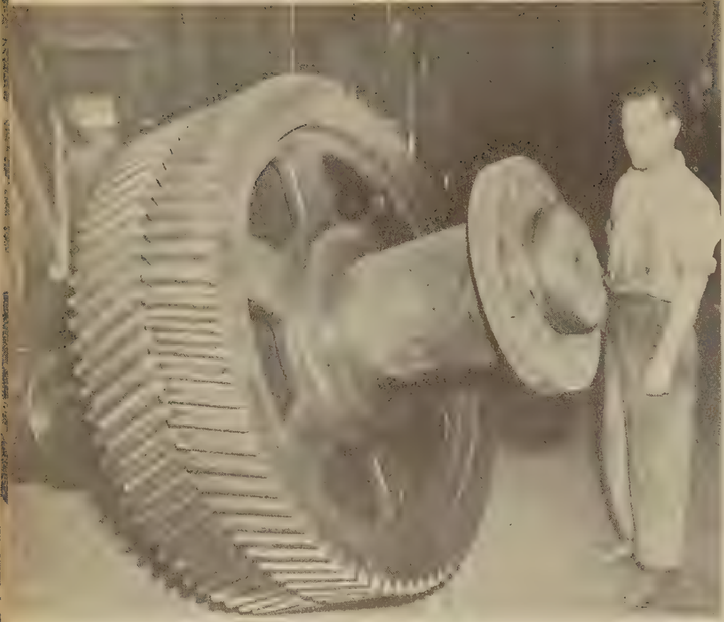


FIG. 6 - Welding the head of this ingot nicking lathe shaft was done without dismantling the setup. The savings from this alone is believed to have paid for the welding.

Furnaces, are not necessarily required for preheating and postheating as a series of flames directed against a rotating surface provide an excellent method of applying heat uniformly. Minimum temperatures should be maintained over the entire surface to be welded irrespective of temporary elevation near the arc.

The heating of large masses of metal deserves special consideration. Heat, improperly applied, can fracture a roll of the type shown in fig. 2. In preheating large cylindrical shapes, uniformity of surface temperature of the work is important, particularly at all points around any given circular section. The limitation of rate of heat application is believed more significant as an expedient to insure uniformity of surface temperature. Heating rates, therefore, should be predicated largely by mass, variation in section size, and by the degree of uniformity assured by the heating medium.

All of the large rolls described were preheated in a car type furnace. The furnace was close to atmospheric temperature when the work was charged, and heating did not exceed 25°F per hr. The rolls were allowed to soak a minimum of 12 hr before removal for welding.

On occasions, large rolls have been heated while revolving in the lathe. Here, heat was applied faster. The surface of the work was permitted to rise on the average about 25°F per hr. Almost the entire length of the roll was heated to near the assigned preheat temperature even though welding was confined to specific areas. This appears adviasable because of abrupt changes in section and because it helps to insure more uniform internal temperatures below the areas to be welded.

While it is difficult to predict a maximum safe rate of heating for an item under a given set of conditions, it doesn't appear possible to harm a forged structure of about 24 in. diam or less with the arrangement described, whatever the rate of heating.

Descriptions of this welding method were selected on the basis of variation in types and sizes of items welded; to show the equipment and operational features; and to demonstrate that such an installation may be useful for purposes other than that primarily intended. Calculated approximate savings are confined to rolls of the type illustrated in fig. 4.

Cast alloy steel back-up rolls of the type shown in fig. 4 are used in pairs in the several finishing stands of a 100 in. semi-continuous plate mill. Each roll weighs approximately 90,000 lb, has a maximum diameter of 54½ in., a journal diameter of 31 in., and an overall length of 18 ft 4 in. In operation these rolls revolve on roller bearings. Roll journals are originally machined to an accurate diameter that will just permit bearing assembles to be slipped into place with a minimum of clearance between the journal and the inner race.

The journals of a number of these rolls were approximately ⅛ in., adversely affecting other equipment and the mill product. The anticipated average remaining life, based on roll body diameter was about 50 pct. The approximate analysis of these rolls is: Carbon, 0.80 pct; manganese, 0.65 pct; silicon, 0.30 pct; chromium, 0.85 pct; molybdenum, 0.40 pct.

FIG. 7 - Sheet mill cold reduction rolls are quen
the journals, the rolls can be rehardened, and the
been so handled to date.

In groups of two and three, 12 of these rolls were preheated in a furnace to 600°F. The journals were then built up with one pass of L-70 electrode; and the rolls were stress relieved at 700°F and furnace cooled to below 200°F. Welding time per roll was about 7 hr, and every roll has been subsequently used a number of times.

Approximate repair costs, calculated for two rolls, were:

Preheating: 60 furnace hr @ $4.31	$258.60
Holding, stress relieving and annealing: 80 furnace hr @ $4.31	344.80
Electrode, L-70: 350 lb @ $0.180	63.00
Flux, L-660: 400 lb @ $0.10	40.00
Welding and machining labor (approximate)	60.00
Electrical current, gas, supervision, transportation, etc. (estimated)	70.00
Total	$836.40

The cost of a new roll is approximately $11,000. On the basis of a 50 pct anticipated remaining life, two rolls are valued at $11,000. Deducting the welding cost per pair gives $10,163.60. As six pairs were processed, the total saving is $60,981.60. In figuring savings, however, the scrap value of the rolls should be deducted. It is interesting to note that the total welding time required to effect this savings was less than 100 hr.

ched to a high surface hardness. By building up journals remachined to size. About 48 rolls have

The 54-in. blooming mill roll shown in fig. 2, was one of a group of four made obsolete. Two had never been used. Metal was provided to adapt these rolls, after they were machined, to another use. Their composition is approximately that of SAE-1060, and L-70 electrode metal was used. The diameter of one portion of the roll was increased 9 in.

A blast furnace blowing engine piston rod, shown in fig. 5 became loose in service. This forged steel rod is hollow except for a short distance at the center of the head fit and at the ends. Cooling water passes in and out of the head through two, 2-in. holes from the surface of the fit to the bore. These holes were plugged with steel disks for welding. L-70 electrode metal was used.

The gear shown in fig. 6 is 62½ in. diam. This photograph serves to emphasize that a portion of an assembly may be built up by welding without dismantling and reassemblying. Savings from this alone probably paid for the weld in this instance.

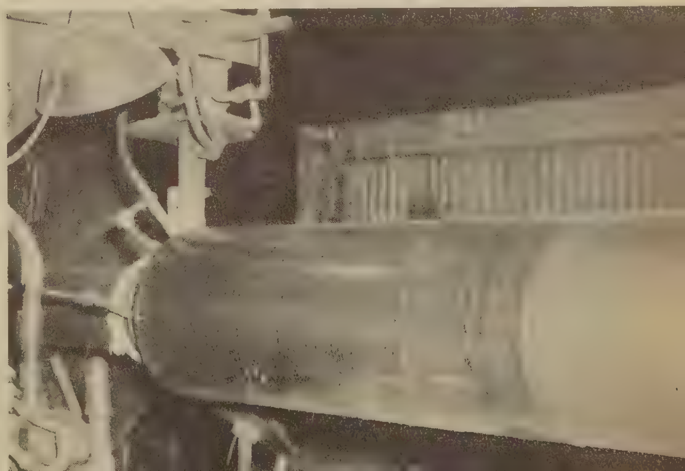
A group of rolls with welded journals shown in fig. 7 are a forged high carbon alloy steel type selectively quenched to an extramely high surface hardness for cold reduction of steel sheet. The depth to which this hardness penetrates is limited and successive dressings eventually expose metal too soft for service. Such rolls may be rehardened by again heating and quenching but this is likely to produce journal distortion. Consequently, the journals of this group were built up by welding, using L-60 wire. After rehardening the rolls, the journals were remachined to their original diameters. About 48 rolls have been welded to date at an average rate of less than 8 hr per roll. A series of beads were deposited over a $^3/_8$-in. deep keyway without any noticeable effect on their character.

Fig. 8 shows the welding of the body and journals of a mill table roller, using L-201 electrode. This is an example where a harder electrode could be used to advantage and safety for building up the bodies as these parts are generally only moderately stressed in service.

Welding track wheel assemblies indicated how well the bead may be controlled under difficult conditions. Both sides of the thin welded flanges are practically straight and vertical, and the welding was done without dismantling the assemblies. L-201 elctrode was used. These high carbon (approximately 0.80 pct carbon) wheels were preheated moderately in the lathe. Once welding has begun, an adequate temperature was maintained by the heat of welding.

The open hearth charging machine peels shown in fig. 9 illustrate a repair occasioned by breakage. In operation, the right end of the peel engages charging the boxes and empties them into furnaces. These heads, alternately heated and cooled in service, frequently break. A new head was machined with a short cylin-

FIG. 8 - The body and journals of the mill table roller were welded with a hard electrode. Evidence of the area that can be covered by this method of welding is shown here.



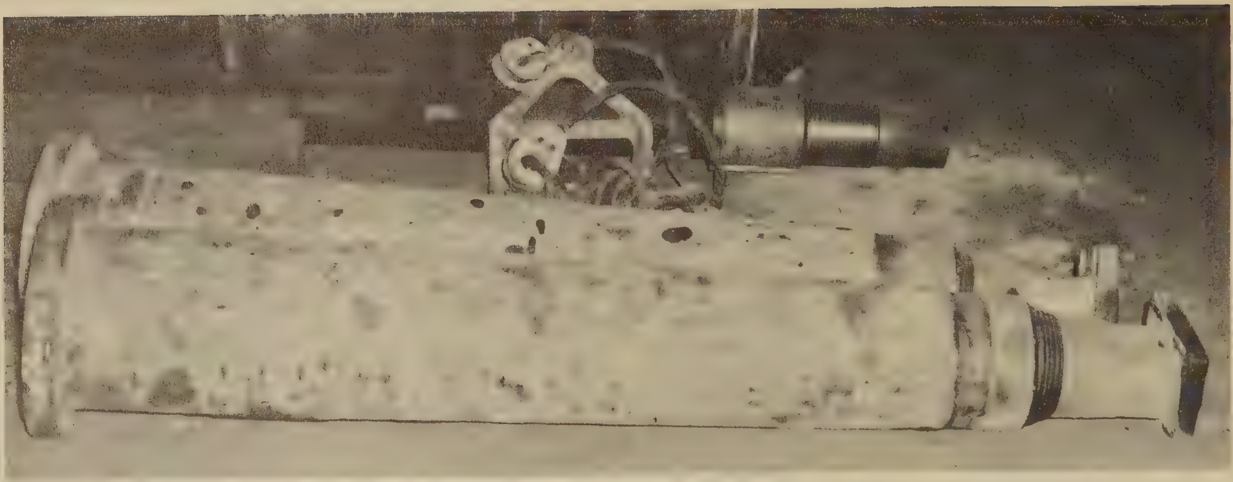


FIG. 9 - Openhearth charging machine peels frequently break off in service. Automatic welding has reduced the repair time from about 8 hr to 2 hr.

drical projection for aligning it to the body of the peel. The opposing faces were machined to provide 45° included angle. The *V* is about 3 in. deep and 7½-in. diam at the base. In welding, the lead screw of the lathe was disengaged and the head manipulated manually until some breadth of weld was obtained. It was necessary to pause occasionally to permit heat to dissipate. A peel can be repaired in less than 2 hr, whereas by manual arc welding, 8 to 10 hr are required.

Broaching Stamped Parts

BROACHING parts after blanking often offers a solution in that a number of parts can be stacked in a broaching fixture and all of the parts broached simultaneously in one pass to close tolerances and good finish. The telephone relay part, shown in fig. 1, and broached in the setup shown in fig. 2, is typical of such an operation. The rough stamping for the impulse arc is blanked to 0.015 in. oversize on the inside arc and is then finished broached, as in fig. 1. The major diameter of the part is 2.174 in. and the minor diameter is 2.098 in. The part is phosphor bronze, 0.64 in. thick, and tolerance on the arcs requires that the cam teeth surfaces be within 0° 3′.

The broach which cuts the 31 teeth on six parts stacked in the fixture at one time is shown on the Colonial vertical press in fig. 2. The machine is of six tons capacity with a 36-in. stroke. A hydraulically operated shuttle type fixture is interlocked with the machine cycle. Clamping, loading, and unloading are manual, but broaching, and shuttling are automatic. Production is said to be 360 parts per hr.

FIG. 1 - Broaching the 31 cam teeth on the bronze impulse arcs for telephone relays gives the desired higher accuracy of cam tooth surfaces while maintaining production.

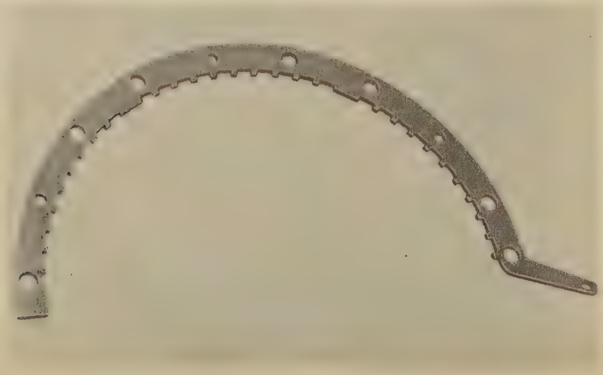
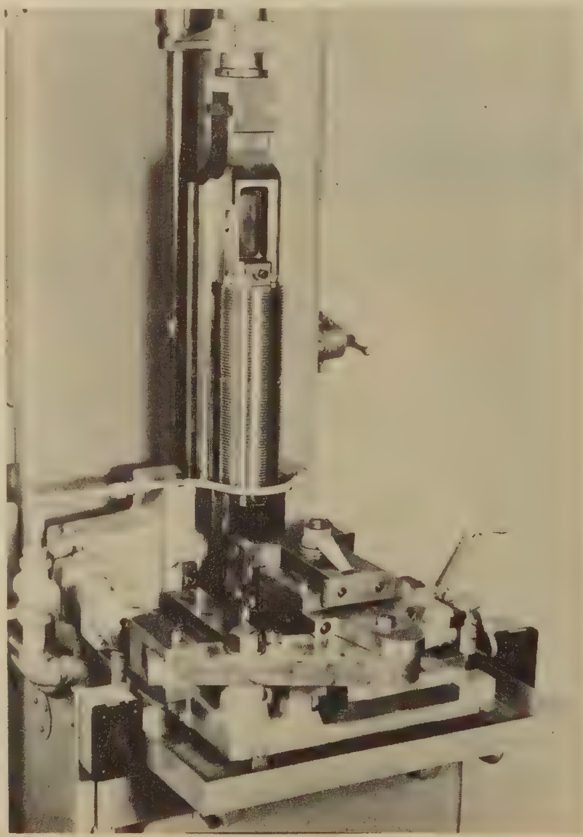


FIG. 2 - Both impulse and center arcs are broached six at a time at a rate of 360 parts per hr on this 6-ton Colonial vertical press-type machine.



Navy Instruments Photograph Instantaneous Phenomena

U. S. Navy Photographs

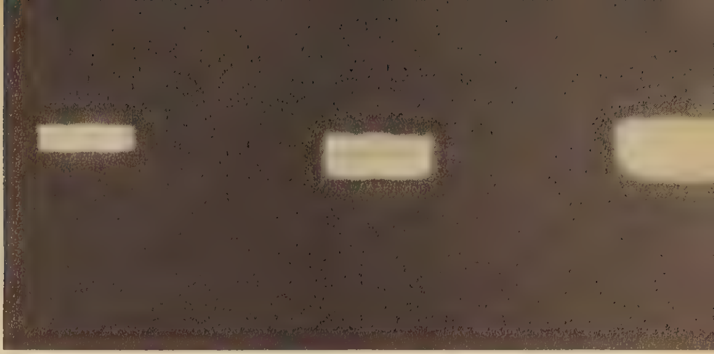


FIG. 1 - Exposures show a fine tungsten wire vaporizing on application of voltage. Views were taken with an exposure time of 4×10^{-8} sec at intervals of 0.15, 0.25 and 0.35 microseconds after start of the phenomenon.

IMPROVED synchronized microtime photographic instruments to be used in the study of rapidly changing phenomena have been developed by Navy scientists. The devices, which in effect measure and magnify time, will enable study of occurrences taking place in a few millioniths of a second that have been hitherto unobservable.

Among the instruments is the Zarem camera which is being applied to the observation of rapid vaporizations and other happenings of extremely short duration. Fig. 1 shows a piece of fine tungsten wire rapidly passing from metal to vapor state on application of voltage.

Shutter speed of the camera is controlled by an electro-optical Kerr Cell, a glass tube with a pair of electrodes immersed in nitrobenzene, fig. 2. The cell is placed between two polaroids crossed so that no light can be transmitted except when a high voltage, applied to the cell electrodes, alters the state of the polarized light to allow the image to pass through the camera lens to the film. Through control of the timing of the voltage, exposures down to 1×10^{-8} sec have been obtained. This is a shutter speed such that light travelling at 1000 million ft per sec moves only 10 ft during the time of one exposure.

A 76-lens camera capable of taking 400,000 frames per sec has also been developed for the Navy. The 76 lenses are positioned in an arc around an 8-sided mirror which revolves at 30,000 rpm to reflect light from the subject through the lenses to a stationary strip of film. The camera is said to be highly successful in studies of shock waves and explosives.

Improvements on the shadowgraph and shock channel for photographing shock waves have also been developed for use in microtime research. Fig. 3 shows a sequence in which a spark shadowgraph has stopped a high power 22 caliber bullet, travelling faster than the speed of sound, first in free flight and then entering and penetrating a plywood section.

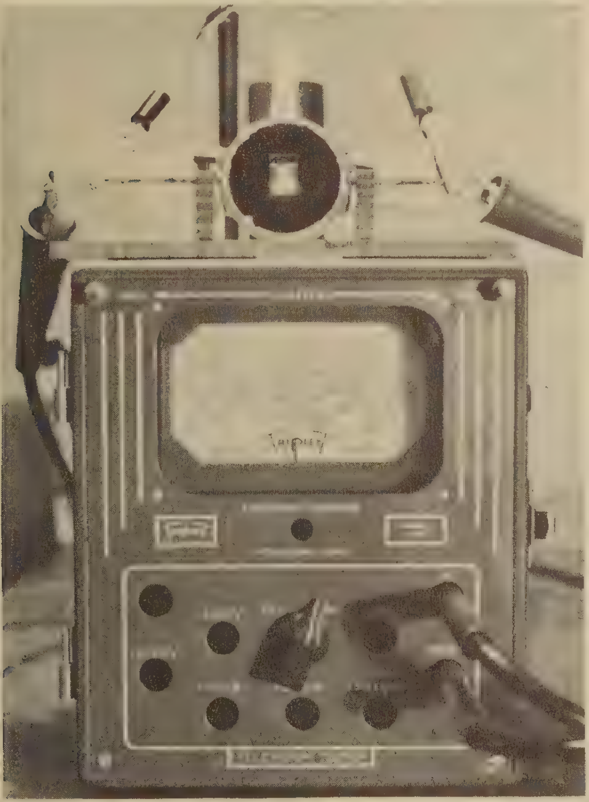


FIG. 2 - Kerr Cell, resting on top of the voltage meter, allows exposure times in the Zarem camera of 1×10^{-8} sec by passing polarized light only when a high voltage is applied to the cell electrodes.

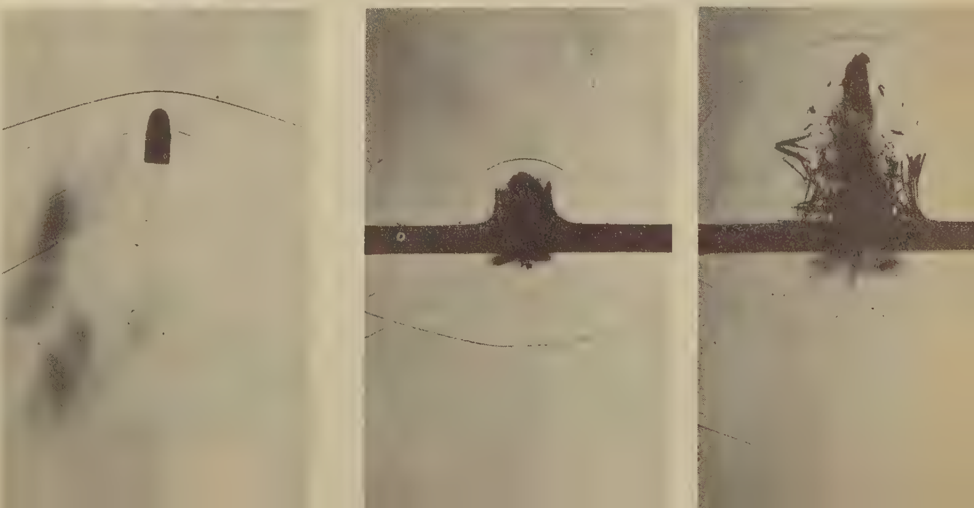


FIG. 3 - Sequence shows a bullet first in free flight, and then penetrating and emerging from a piece of ¼-in. plywood. Note the well defined shock waves and the turbulence in the wake of the slug.

Driven Backup Rolls Used

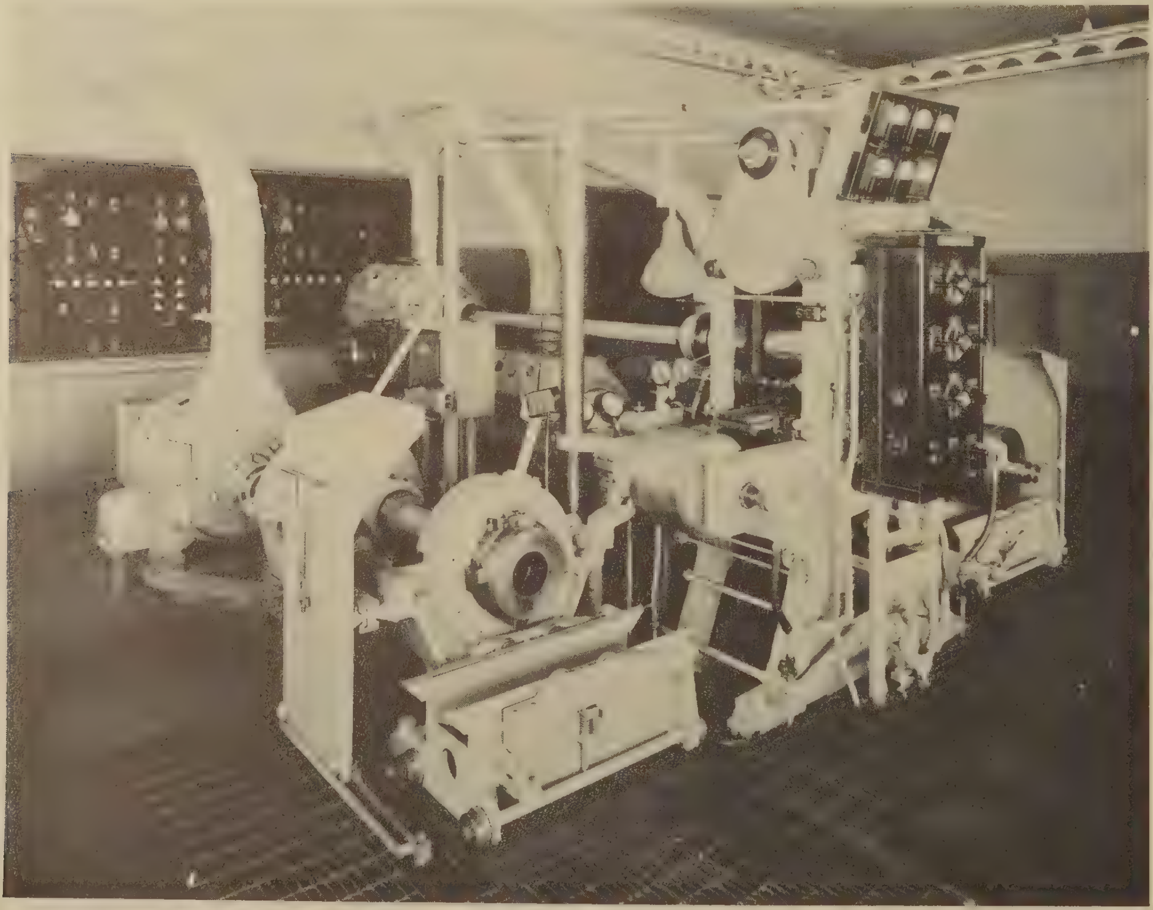
DRIVEN backing rolls and substantial front and back reel tension are being used in a four high, reversing cold strip mill to overcome strip breakage, drive deficiencies and other shortcomings of the Steckel mill, according to a paper by L. L. Wilson, Cold Metal Products Co., Youngstown, presented at a recent AISE meeting.

A 10-in. mill designed on this principle, fig. 1, which was made by the Cold Metal Products Co. to serve as a finishing mill for light gage razor blade steel, stainless steel and silicon steel, has been in production usage for over a year. Results have reportedly been sufficiently satifactory to warrant application of the design to a larger mill for general all-purpose production.

Since the paper was read before the AISE meeting, tests have been made to determine how much power could be transmitted to the working rolls through the backup rolls by friction without slippage. Using 0.083-in. low carbon strip as the test material, 80 to 83 pct reductions were established as the maximum for a single pass. Usually the slippage was between the strip and work rolls rather than between the backup and work rolls. Such severe reductions would not be practical on a production basis and were run for the express purpose of slippage study.

On the experimental mill ,reductions approaching those considered normal with low carbon steel could be made and reductions of over 35 pct per pass were made on soft stainless and silicon

FIG. 1 - Four high, reversing cold strip mill uses driven backing rolls and substantial front and back reel tension.



in Cold Strip Mill . . .

This article describes a four high, reversing cold strip mill designed to overcome drive deficiencies, strip breakage and other disadvantages of the standard Steckel mill. Results of the production use of an experimental 10-in. unit on light gages are discussed and specifications for a larger mill of the same design for all-purpose rolling are given.

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steels. When rolling the light gages, production was said to be from 3 to 10 times that of an almost duplicate mill of the Steckel type. Strip breakage on a mill of this design is much less likely so that delays from this cause have been found to be greatly reduced.

The 10-in. mill has work rolls of 3-in. diam and backup rolls of 14-in. diam. Originally 1¾-in. working rolls were used; but experience proved these smaller rolls required too frequent regrinding and generally would not hold their shape in the face of the heat from heavy reductions. The 3-in. rolls are said to have been satisfactory from these standpoints. Power is supplied by 50-hp motors driving each backing roll and each tension reel. Fig 2 shows the drive shaft system.

Plans for the larger mill, which is to be suitable for intermediate reductions of light, medium or heavy gages as well as for rolling to final specification, call for 6-in. diam working rolls. The rolls will be 28 in. over the shoulders and will be able to handle 26 in. wide strip. The load expected and the variety of work to be done have led to selection of 34½-in. diam backup rolls. Heat dissipation, coil size and other considerations of practicality have set 1800 fpm as the maximum speed.

Bearings for the larger mill will be of double row radial roller bearing type. Screwdown is to be of motor driven, wedge type design. Cooling facilities will be standard. Mineral oil will be used as the coolant with a provision for substitution of soluble oil when necessary. Water cooled, 24-in. diam guide drums will also be used to contribute to strip cooling.

Tension reels for the mill are bottom coiling which will allow inspection of both sides of the strip, and will give a sharp break from the pass line and a long arc of contact with the cooling drums. Solid type reeled drums, supported by bearings at both ends to avoid coil tightening and collapse, will be used. These reels will produce a 26-in. ID coil in sizes up to 400 lb per in. of width and up to 53 in. OD.

All the conventional controls are provided, and on the larger model will probably be mounted on the housings or on a swinging panel attached to the housings.

As an indication of the work accomplished with the small mill, low carbon was rolled from 0.020 to 0.006 in. with 3 passes. Similarly in taking 3.3 silicon steel from 0.025 to 0.010 in., 3 passes were used.

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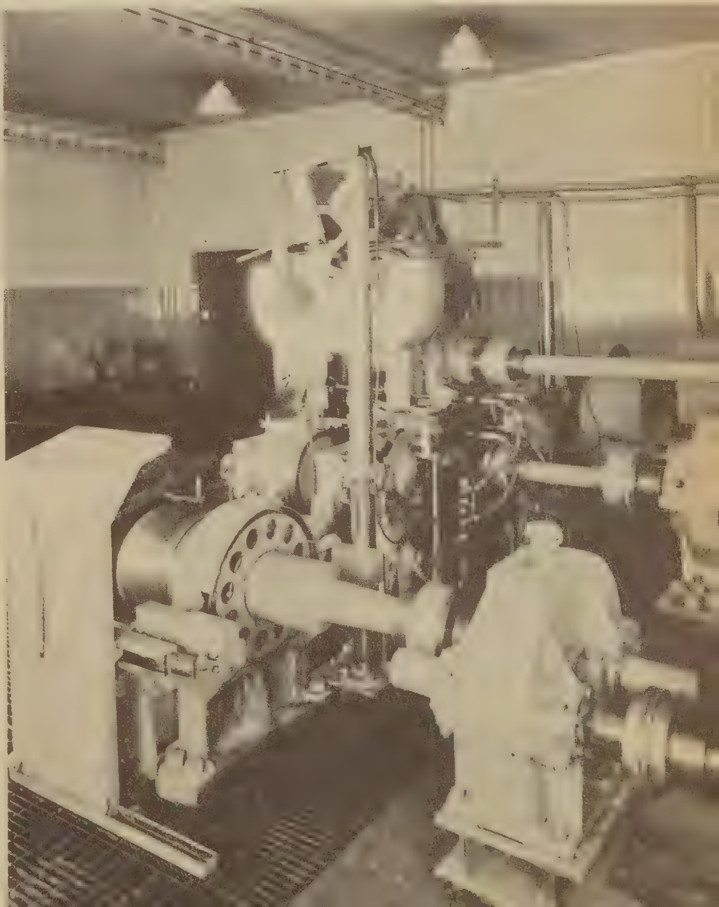
FIG. 2 - Drives to one of the tension reels and to the backing rolls are shown. Power for this 10-in. mill is supplied by four 50-hp motors.



Radioactive Isotope

R.L. Templin, assistant director of research and chief engineer of tests, Aluminum Company of America, New Kensington, Pa., newly elected ASTM president.

L.J. Markwardt, assistant director, U.S. Forest Products Laboratory, Madison, Wis., newly elected ASTM vice-president.

MINDFUL that the need for more authoritative knowledge of the properties of materials is ever growing, and particularly so with new materials and combinations of materials, as well as new instrumentation and testing, notably radioactive isotopes, their development and application, some 1800 members of the American Society for Testing Materials gathered in Detroit, during the week June 21 to 25, to participate in the society's 51st annual meeting. Heat and humidity notwithstanding, a program of some 20 technical sessions and more than 300 meetings of the technical committees, concentrating their work on standards and research in materials, awaited attention.

Throughout the week, the eighth exhibit of testing apparatus and related equipment was in progress, supplemented with the sixth photographic exhibit, which followed the theme "Materials, Testing and Research." These exhibits are sponsored every 2 years, the purpose being, particularly in the case of the testing apparatus exhibit, to make possible a review of the progress made in the field by presenting displays by the leading companies in the apparatus industry, as well as special research and educational displays sponsored by the society's committees, research institutes, etc.

The annual dinner was featured by the address of ASTM President, T. A. Boyd, research consultant, General Motors Research Laboratories, Detroit, entitled "If Dr. Marburg Came Back Today," and by the awarding of honorary memberships to the following members: Harvey Lincoln Curtis, retired; Frank H. Jackson, principal engineer of tests, Public Roads Administration, Washington, and William B. Price, retired.

Newly elected officers introduced at the banquet included: President, Richard L. Templin, assistant director of research and chief engineer of tests, Aluminum Co. of America, New Kensington, Pa.; vice-president, L. J. Markwardt, assistant director, U. S. Forest Products Laboratory, Madison, Wis. New members of the board of directors are: Leslie C. Beard, Jr., chemist and assistant director of laboratories, Socony-Vacuum Oil Co., Inc., New York; Simon Collier, director of quality, Johns-Manville Corp., New York; Theodore P. Dresser, Jr., chief engineer, Abbot A. Hanks, Inc., San Francisco, Howard K. Nason, associate director, Central Research Dept., Monsanto Chemical Co., Dayton, Ohio; and Edgar W. Fasig, general superintendent, Lowe Brothers Co., Dayton, Ohio.

Announcement was also made that the 1949 annual meeting will be held in Chalfonte-Haddon Hall, Atlantic City, from June 27 to July 1. In addition, a national meeting of the society will be held on the Pacific Coast during 1949, in San

Use Explored at ASTM Meeting

Marburg Lecturer discusses radioactive isotopes and their industrial applications . . . R. L. Templin elected president of ASTM . . . New high temperature data presented . . . 1949 Pacific Coast meeting announced.

Francisco, from Oct. 10 to 14. Committee week and the spring meeting will be held in Chicago during the week of Feb. 28, 1949, at the Edgewater Beach Hotel.

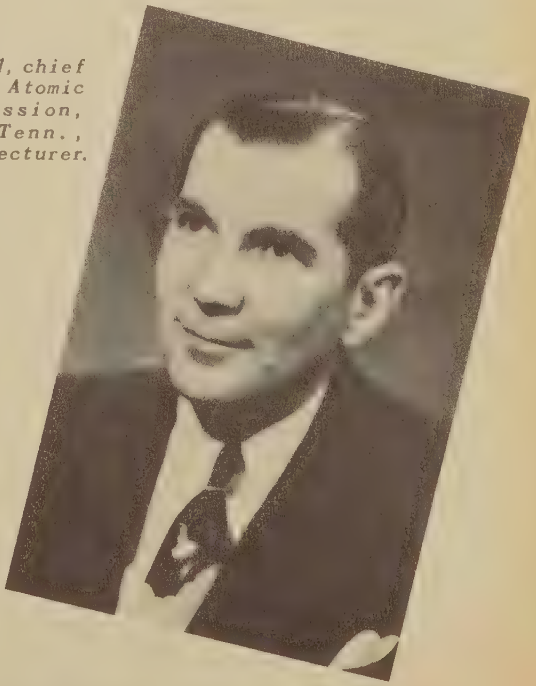
The 20th award of the Charles B. Dudley Medal was made to P. R. Toolin, research engineer, Mechanics Dept., Westinghouse Research Labs., East Pittsburgh, Pa., and N. L. Mochel, manager, Metallurgical Dept., Westinghouse Electric Corp., Lester, Philadelphia, for their paper on "The High Temperature Fatigue Strength of Several Gas Turbine Alloys." G. S. Burr, W. J. Gailus, J. O. Silvey, S. Yurenka, and A. G. H. Dietz, all of Massachusetts Institute of Technology, Cambridge, Mass. received the 3rd Richard L. Templin award for their paper entitled "Universal Plastics Testing Machine." Both papers have been published in the 1947 ASTM Proceedings.

Highlight of the technical phase of the annual meeting was the 22nd Edgar Marburg Lecture, "Isotopes and Their Application in the Field of Industrial Materials," delivered by P. C. Aebersold, chief, Isotopes Div. Atomic Energy Commission, Oak Ridge, Tenn.

Reviewing the many applications towards which radioactive isotope research has already been directed, including such fields as medical therapy, animal and plant physiology, bacteriology, chemistry, physics and metallurgy, Dr. Aebersold suggested that the advent of radioactive isotopes has probably been the most constructive contribution of fundamental and applied science yet realized by the many and varied phases of nuclear research. He indicated that the use of isotopes in the field of industrial materials is potentially a great one, asserting that as tracer atoms they may be used in research aimed at improvement of material and increased efficiency of production.

Tracer atoms are being used widely in investigations covering such varied topics as friction, steelmaking, welding, corrosion, diffusion, catalysis, and chemical exchange, he said. Radioisotopes may also play an important role in process control, but for the present most applications of this type are still in the stage of development; the reason for the slower expansion in this phase of industry being the problem of radiation protection with respect to industrial hygiene and general public safety.

Of the many interesting and informative symposiums held during the week, including topics such as Metallography in Color, Magnetic Testing, Deformation of Metals as Related to Forming and Service, Effect of Temperature on Properties of Metals, Speed of Testing, and Corrosion of Ferrous Metals, to mention a few, space limitations prevent the presentation of extensive discussions in this report. Several thought-pro-



P. C. Aebersold, chief Isotopes Div., Atomic Energy Commission, Oak Ridge, Tenn., 1948 Marburg Lecturer.

Leslie C. Beard, Jr., chemist, Socony-Vacuum Oil Co., Inc., New York, newly elected ASTM director.

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Edgar W. Fasig, general superintendent, The Lowe Brothers Co., Dayton, newly elected ASTM director.

Howard K. Nason, assistant director, Central Research Dept., Monsanto Chemical Co., Dayton, newly elected ASTM director.

voking individual papers are, however, briefly reviewed in the following text.

Some new and interesting data were revealed in a paper entitled "High Temperature Properties of Rotor Discs for Gas Turbines as Affected by Variables in Processing," by J. W. Freeman and E. E. Reynolds, University of Michigan, Ann Arbor, Mich., and H. C. Cross and W. F. Simmons, Battelle Memorial Institute, Columbus, Ohio. Short-time tensile, rupture, creep and stress time for total deformation characteristics were determined at temperatures of 1200°, 1350° and 1500°F, for eight different heat-resisting alloys, some of which were tested as hot forged, some as hot-cold worked, and others as solution treated or solution treated and aged. Most of the test work was done on specimens cut from areas of the discs near the rims and taken radially to the rims.

The investigators found that properly hot-cold worked or as-forged materials, except for Inconel X, have the best properties up to 1200°F. Differences in rupture strength resulting from differences in processing or fabrication decrease with increase of testing time and with increase in testing temperature.

At 1350°F, solution treated and aged materials have properties equal to or better than hot-cold worked and forged materials, and at 1500°F are definitely superior. There were some indications that aging of solution-treated material at 1350° to 1400°F produces higher strengths than aging at 1500°F.

There are no consistent relationships between tensile properties and rupture, creep or stress time for total deformation characteristics. The creep strengths follow the trend of the rupture strengths and comparison of these strengths indicates that creep strengths are not a reliable, and are sometimes a dangerous, basis of extrapolation for determination of longtime load carrying ability.

The strengths for amounts of total deformation up to 1 pct tend to follow the same trends as the rupture strengths, and neither the strengths for total deformation, creep, or rupture appear to bear any relationship to the elongations measured either in the tensile or the rupture tests.

In general, the authors found that the properties of the heat-treated higher alloyed discs approximate reasonably well the properties which have been obtained from similarly treated bar stock. The as-forged discs, however, may or may not have had the same properties as bar stock depending on the differences in forming procedures used in their preparation.

Two principal methods presenting employed for controlling speed of testing relate to rate of application of load and to rate of movement of testing machine crosshead. Controlling speed of testing utilizing a third method, is now practicable with the aid of recently developed equipment for controlling the rate of straining in the specimen.

This new device, which was described by L. K. Hyde, O. S. Peters Co., Washington, in his paper "Methods and Equipment for Controlling Speed of Testing," is used in conjunction with autographic stress-strain recorder equipment, and furnishes the testing machine operator a visual indication of the relationship between actual straining rate and preselected uniform straining rate. This enables the operator to maintain manual control of the testing machine so as to maintain uniform straining rate within the specimen gage length.

The strain indicator consists essentially of a suitably marked rotatable disc driven by a synchronous motor through a variable gear system, with a coaxially mounted pointer driven by a transmitter unit located in the stress-strain recorder. The machine operator maintains a uniform straining rate by manipulating the testing machine controls so that movement of the pointer is synchronized with that of the disc. The author asserted that utilization of this method testing speed control makes possible the reproducibility of testing speed conditions in the specimen throughout the elastic range and as far into the plastic range as may be desired. It is also said to permit a type of testing speed control which relates directly to the specimen under test rather than to some function of the machine in which it is tested.

New Production Ideas . . .

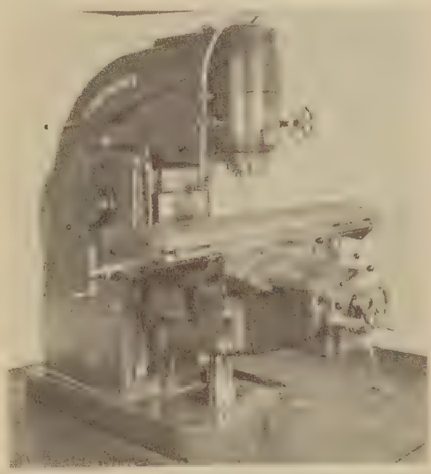
New or improved models of transfer machines, dial type milling machines, a multi-spindle screw machine, multi-welders, a press for drawing cylindrical tanks, a die hobbing press, an automatic molding unit, bending rolls, and a high-speed flanger are featured this week, together with high pressure pumps, motor generators, and a water-wash spray booth.

Transfer Machines

A NEW line of four double end transfer machines has been announced by *Motch & Merryweather Machinery Co.*, Penton Bldg., Cleveland 13, on which the work piece is sawed to length and transferred to position for machining both ends while the second piece is being cut off. Four sizes are available: No. 00-T-2 for 1¼ in. solid stock or 2-in. tubing; No. 0-T-3 for 3-in. solid or tube stock; 0-T-4 for 4-in. solid or tubing; 2-T-6 for 6-in. solid or tubing. Standard bar stock is fed automatically, cut off with square ends within ±0.001 in. and to accurate lengths of ±0.004 in. It is then automatically transferred to equalizing jaws for accurate, double-end machining, which may be chamfering, center drilling, center drilling and chamfering both ends; threading, trepaning or turning one or both ends; chamfering OD and ID of tubing; reaming one end or both ends of tubing; and chamfering ID and reaming both ends of tubing. A milled finish with ±0.004 in. eliminates a facing operation.

Dial Type Milling Machines

A NEW dial type milling machine announced by *Cincinnati Milling Machine Co.*, Cincinnati 9, is built in medium and high speed ranges, plain, universal and vertical styles, Nos. 2, 3, and 4 sizes for each. Power speed and feed change operate with a single two position lever at the front control position or a similar lever at the left-hand side of the column. The machine performs the actual work of shifting gears. While the operator holds the lever in the speed or feed change position, the speed or feed dial clicks around, and upon release of the lever the proper gears are in mesh for the speed and feed indicated. High speed machines have 21 spindle speeds, 20 to 1500 rpm for the No. 2 size and 18 to 1300 rpm for the No. 3 and 4 sizes, in approximate geometrical progression. Twenty-four feeds cover a range of 5/16 to 60 ipm. Medium speed machines have a slightly smaller selection of speeds and feeds, and the upper limits are 1/3 those for high speed machines. Lubrication is principally automatic.



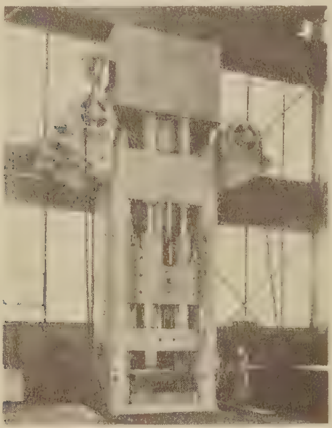
Multi-Spindle Screw Machine

A SIX spindle automatic screw machine has been built by *New Britain-Gridley Div.*, New Britain, Conn., to handle carbide tooling and has a standard capacity of 2¼ in. The six cross slides are radial to the center line of the spindle carrier and are 60° apart, an arrangement which gives the same line of forming thrust in each position and allows interchangeability of tool holders among the five heavy duty forming slides. Cross slide cams are within the cross slide mountings and, being directly behind the slides, eliminate deflection. Tool holders are interchangeable, cross slide cams are easily changed, and attachments are conveniently applied. A universal main tool slide adjustment permits the selecting of any ratio of approach to feed without changing high point, drawback, stops, or total stroke.

Multi-Welder

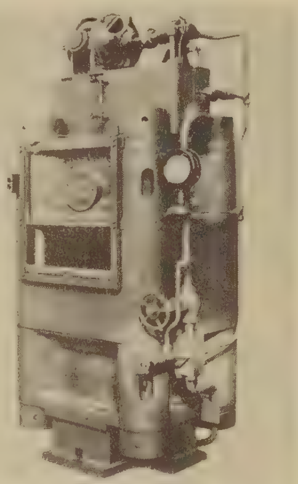
THE latest model of multi-welding machines produced by *Rex Welder & Engineering Co.*, Kansas City 8, has an overall welding width of 112 in. and is equipped with two slitters and two trimmers. While various widths of finished fabric can be secured, it is set for three finished rolls 36 in. wide. The welder has a range of from 18 to 12 gage W. & M. Welding heads or transformers are arranged so that spacings of 1x1 in. and larger can be secured with a minimum of change. The longitudinal wire can be increased by increments of ½ in.; the transverse wire by increments of 1 in. The welder is equipped with 56, 10 kva, 440 v, water-cooled transformers, each having its individual heat control switch with three tap settings. The machine is operated by a 15 hp motor and actual welding speed is better than 60 welds per min, making the average production of finished mat approximately 45 sq ft per min on 1x1-in. mesh. Approximate speed is 7000 welds per min. Standard No. 1 Morse taper tips are used in the upper electrodes; the lower welding tips are specially designed for this machine. Overall dimensions of the machine are 19x15 ft. The multi-welder can be operated by one man with one reel man to handle the feed.

Deep Drawing Press



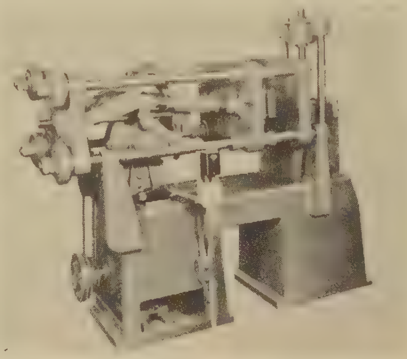
TO deep draw long cylindrical tanks for gas and liquid storage, a 78-ton double action deep sheet metal drawing press with a maximum drawing capacity of 4 ft is announced by *Hydraulic Press Mfg. Co.*, Mt. Gilead, Ohio. Typical of the work for which this press is designed is production of parts 36 in. diam x 28 in. deep which are drawn in a single stroke from a blank 72 in. diam. Up to 1500 tons pressure can be applied. Pressure exerted by the blankholder slide may be independently controlled at each of the four corners. Pressure of the punch carrying slide which has a stroke of 72 in. is also independently adjustable. A high-speed booster ram with automatic shiftover permits higher pressures when needed. This feature is claimed to more than double initial drawing speeds. Radial pumps with direct electric motor drive consists of two motors of 200 hp each and generates hydraulic pressure for press operation. Pressing surfaces for mounting dies are 72x72 in. Height is 34½ ft.

Die Hobbing Press



RATED at 500 tons pressure at a pressing speed of 2 ipm, a hydraulic die hobbing press, announced by *E. W. Bliss Co.*, 450 Amsterdam Ave., Detroit 2, is used by manufacturers needing a number of reproductions of certain dies for use in multiple stamping operations. These reproductions are obtained by forcing a master punch into metal blocks, the resulting cavities conforming to contours of the master punch. The press is completely selfcontained. The frame consists of two steel castings rigidly mounted on four heavy steel tie rods. Safety shields are provided for all openings to the die space. Control of the press is by means of manually operated valves fitted with handwheels. The press has 6-in. stroke; the vertical opening measures 10 in. max, 4 in. min.

Diecasting Machine



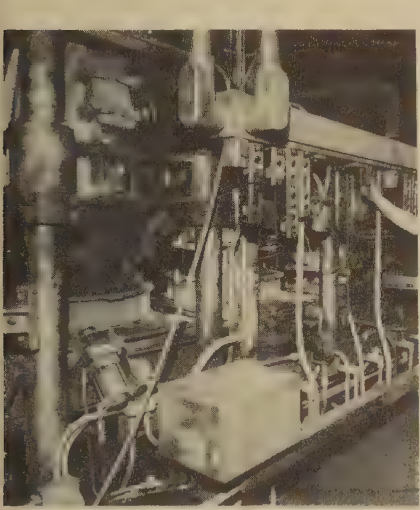
A LARGER, hydraulic model of the Workhorse fully automatic diecasting machine for zinc, tin, or lead production, has been announced by *Light Metal Machinery, Inc.*, 736 Penton Bldg., Cleveland. Shot capacity is 32 oz, with top speed of the machine rated at 720 shots per hr. Other speeds are 520, 340, and 240. The casting cycle is completely automatic, the die movement, shot and ejection following in continuously repetitive cycles. The machine's higher output enables plants to use single cavity dies.

High-Speed Flanger

FULLY automatic high-speed flanging of square or rectangular cans at speeds up to 150 cans per min is claimed for a machine which die-flanges both ends of the can simultaneously, producing an even right-angle flange on corners and sides of the can without distorting the body. Known as the Hamilton-Kruse Model 406, the machine is built by *Owens Rentschler Co. Div., Lima-Hamilton Corp.*, Hamilton, Ohio. The flanger consists of five flanging stations and is said to be selfcontained with a 3-hp motor mounted in the base. A heavy shaft mounted on roller bearings is claimed to prevent any deflection of flanging heads when taking full flanging load. Model 406 is a one-quart flanger, while a similar flanger, Model 304 which is a three-station machine, is available for ½, 1 and 2-gal cans.

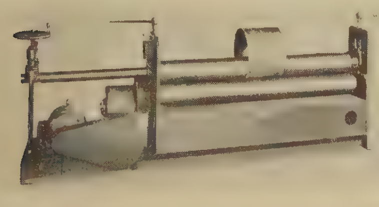
Automatic Molding Unit

A SELFCONTAINED molding machine performing all functions and operations to produce molds, from introduction of the sand through completion of multiple molds stacked six high and ready for pouring, has been jointly developed by *Westinghouse Electric Corp.*, 306 4th Ave., Pittsburgh 30, and *International Molding Machine Co.*, Lagrange Park, Ill. This machine is believed to be the first completely automatic molding unit for mass production of castings by multiple molding methods and it is claimed to increase the yield of high-quality castings at reduced cost. Equipment is arranged in a synchronized operating sequence and is actuated by air and hydraulic power under electrical timing. There are four principal work positions in the molding unit. Sand is blown into a flask at the first position to make a preform of the mold. In the second position, sand in the flask is squeezed around a drag pattern in the bottom of the flask under pressure of 50 tons by a head carrying a cope pattern. The drag pattern is removed in the third position and flasks are stacked six high in the fourth position to make five molds in each stack.



Bending Rolls

SERIES 650 pyramid type bending rolls featuring high roll clearance between top and lower rolls to permit rolling of heavy bars and light structural shapes as well as plates, have been marketed by *Reed Engineering Co.*, P.O. Box 415, Carthage, Mo. The two lower rolls are spaced closely together to minimize the flat spot normally found on sheets or plates rolled in machines of this type. All main rolls are forged steel with a 7½-in. diam top roll on all sizes and lower rolls of 6½-in. diam. Rolling speed of 18 fpm is developed with a 5-hp main driving motor. Drop end construction is employed to permit removal of fully rolled circles from the top roll. Standard features are listed as all-steel construction, bronze bearings, silent worm gear drive, top roll indicators, electric reversing control for motor drive, anti-torque type frame and ratchet wrench adjustment of the top roll. Capacity ranges from 4 ft x 7/16 in M.S. on Model 654 to 8 ft x ¼ in. M.S. on the model 658.



High-Pressure Pumps

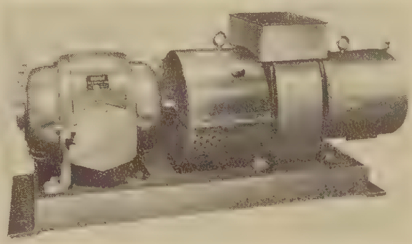
A DESIGN development of interest to users of high pressure pumps is the standardization of parts for 6-in. stroke Triplex, Quintuplex, Septuplex and Nonuplex, and 7, 7½, and 8-in. stroke Quintuplex, Septuplex and Nonuplex pumps. This has been done to permit the use of identical wearing parts such as bearings, crossheads, wristpins and valves, regardless of plunger diameter and number of plungers. Increases in capacity of the pumps, which are manufactured by *Aldrich Pump Co.*, Allentown, Pa., has been accomplished by increasing the number of pumping units. Pumps are supplied with 3, 5, 7 and 9 plungers. In the 6-in. stroke line, the Triplex has a 300-hp rating, the Quintuplex has 500 hp, the Septuplex has 700 hp and the Nonuplex carries the hp rating to 900. The 7, 7½ and 8-in. stroke pumps carry the ratings from 1300 to 2400 hp.

Water-Wash Spray Booth

A 17 to 1 reduction in overall maintenance is claimed for a new water-wash spray booth that removes and cleans paint laiden air, which *Despatch Oven Co.*, 8th St., Minneapolis 14, has announced. In this model air travels through a minimum of 5 water curtains before it is exhausted. The front curtain slopes slightly to permit 56 gpm of water to pass down each foot of the curtain length without splashing. The header supplies this flow as well as two others inside the eliminator section which are individually controlled to meet demands. Two headers running horizontally through the eliminator section have a series of orifices along the top. Water is divided to form two curtains which are said to be doubly effective by baffles which throw water back across the air passage, creating another curtain. The settling tank of the booth allows the washed out paint to accumulate for reclaiming. Paint elimination in sludge dams and screens is said to be complete and no paint goes back through the system to clog the pump or orifices in the headers.

Motor-Generators

HIGH frequency motor-generators with output frequencies of 300-400 cycles and size ranges from 1 to 250 kw have been designed by *Bogue Electric Mfg. Co.*, 40 Iowa Ave., Paterson, N. J., for the operation of high speed machine tools and motors. These high frequency power units permit operation of tools at high speeds without the necessity of high speed gear ratios, and develop higher speeds from lighter weight equipment of simplified construction. The motor-generators can be used for a source of high frequence ac for general and laboratory use.



Spin Riveter

A PNEUMATIC riveting machine, combining hammer action with rotation supplied by an air motor, operates off both line pressure and exhaust air from four interchangeable capacity heads. The unit is a product of *Schlack Mfg. Co.*, 13255 Birwood, Detroit 4. The motor consumes 6 cfm at 25 psi when operating off line pressure. Exhaust operation requires only the amount of air consumed by the head. Motor and hammer operate only while riveting. Interchangeable heads having capacities of 3/32, 5/32, ¼ and 5/16 in. based on mild steel rivets, produce 4000 to 10,000 short stroke blows per min. Peening tools mounted on taper of spindle can be supplied to form round, oval and flat heads. Eyelets and tubular rivets can also be riveted.

Universal Power Unit

FOR turning rounds or hexagonal shapes requiring up to 400 lb circumferential turning force at a surface speed of from 3 to 26 ipm, *Kinmont Mfg. Co. Inc.*, 718 W. Wilson Ave., Glendale 3, Calif., has marketed a universal power unit adaptable as a positioner for welding, cutting, fitting, grinding, threading, painting, sandblasting, and similar operations. The unit, which weighs 71 lb, operates on the chain tong principle with quick action connecting links for lengthening chain to accommodate large work. Adjustable roller fixtures may be used for handling large tanks, so that full weight is not imposed on the power unit. It is claimed that objects weighing up to 20,000 lb can be handled. In pipe welding, the unit will turn several hundred feet of pipe while welders operate. In larger types of fabrication, it has been designed to turn boilers and tanks as large as 24 ft in diam and weighing as much as 10 tons.

Bench Filer

INFINITELY variable speed in a precision die filer is a development of the *DoAll Co.*, Des Plaines, Ill. The machine, manufactured by All American Tool & Mfg. Co., Chicago, uses a DoAll Speedmaster, Model No. 3A, which provides stepless speeds from 170 to 470 strokes per min. Speed changes are accomplished by turning a hand wheel. Slow speeds are required for filing and sawing high chrome steels, medium speeds for general purpose work, and high speeds for honing. Files are available in 12 different shapes, three grades of coarseness and two shank sizes, with corresponding cross-section sizes. Honing stones are available with flat or radius cutting surfaces. Diamond hones, for finishing carbides and metals harder than Rc 65, are also available. A two-power magnifier equipped with twin lamps provides illumination for the most exacting work.

Heat Fatigue

FOR the prevention of heat cramps and heat exhaustion, heat fatigue drops, made in special butterscotch candy form, have been announced by *Benson Laboratories, Inc.*, Bessemer Bldg., Pittsburgh. They contain sodium chloride and two other body salts in the same proportion as lost in perspiration. They also contain dextrose to provide a quick energy restorer. Drops are individually wrapped. The average employee will use about six per day.

Eye Sweep

METALLIC fragments, filings or other foreign metal substances subject to magnetic attraction can be removed from the eye with a new first aid eye sweep, announced by *General Scientific Equipment Co.*, 2700 W. Huntington St., Philadelphia 32. One end of the instrument is fitted with a magnet for removing steel splinters; the other is fitted with a flexible loop for removing cinders, dust and other particles. Sterilization of the instrument will not diminish the magnetic qualities nor affect the loop.

Ventilated Contact Wheel

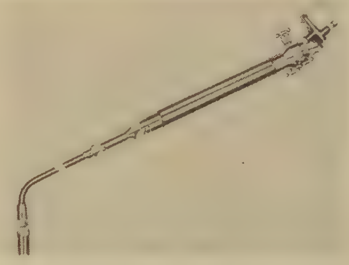
A NEW Airway ventilated contact wheel for abrasive belt polishing has been announced by *Jackson Buff Corp.*, 21-03 41st Ave., Long Island City, N. Y. It has been designed for contour or flat work on stainless or carbon steel stampings, aluminum, brass, diecastings and forgings. The wheel is said to offer maximum resilience, yielding readily to pressure, and springing back into shape quickly. Wheels are available in 6 to 16 in. diam in standard sections of ½-in. face.

Perforated Steel Box

PARTS and products in a variety of sizes and shapes can be washed and degreased in a perforated steel box manufactured by *Rack Engineering Co.*, 925 Liberty Ave., Pittsburgh 22. The steel box has perforated bottom and sides, and is built in six standard sizes.

Welding and Heating Torch

A THREE-HOSE torch, using two tanks of acetylene and one of oxygen, has been designed by *Weldit, Inc.*, 990 Oakman Blvd., Detroit 6, for welding, heating or brazing broken parts on heavy machinery, expanding tie rods, for heavy press installations, for bending large diameter pipes and wherever rugged maintenance work is needed. A feature of the torch is the quick operating oxygen cutoff which instantly and automatically shuts off the oxygen supply. The torch is also supplied with two-valve control for using propane, natural or manufactured gas and oxygen for heating purposes. It has a sturdy brass handle and Monel tip-tube. Overall length is 51 in., weight is 6 lb 12 oz. It can be furnished for welding or with multiple-flame tips for heating.

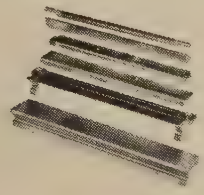


19 EXTRUDED SHAPES
speed re-gauging of hosiery knitting machines

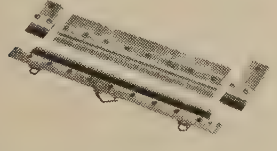
Two sections of a hosiery knitting machine, converted to 51 gauge by Fred C. Good & Sons, Inc., Philadelphia, with extensive use of Revere Extruded Shapes.

LIST OF EXTRUDED SHAPES

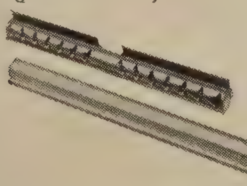
Sinker Head with Verge Plate, complete with sinkers and dividers
5 brass extruded shapes
Knocking-Over Bar
2 brass shapes
Welt Bar
2 aluminum extruded shapes
Picot Bar
2 aluminum extruded shapes
Narrowing Fingers
1 brass, 1 aluminum shape
Jack Bed and Spring Bar
5 brass shapes, 1 aluminum
Needle Bar
2 magnesium, 1 brass shape



Some parts of the Sinker Head, and Knocking-Over Bar, with the Extruded Shapes from which they are made.



Narrowing Fingers, Picot Bar, Welt Bar, all using Extruded Shapes.



Needle Bar, with the larger of the two magnesium Extruded Shapes that save so much weight.

YOU would never think that a business such as Revere's would be affected by fashion, but sometimes it is. Take women's hosiery. The demand for sheer stockings has resulted in a tremendous re-gauging of knitting machines, to convert them to 51 gauge from the coarser pre-war gauges. In carrying out such re-gauging, Fred C. Good & Sons, Inc., Philadelphia, Pa., has become a good customer for Revere extruded shapes, which are used in making new essential knitting parts, except, of course, the needles.

The Revere Technical Advisory Service collaborated closely with the Good engineers in this wide use of extruded shapes, with particular attention to flatness, straightness, and uniformity of alloy and temper. Knitting to fine gauges means narrow tolerances. In 51 gauge, for example, 476 sinker slots have to be cut in 14″, and the tolerance overall must be held to 0.0015″. This requires especially uniform material to begin with, such as Revere supplies and exceptional machining skill.

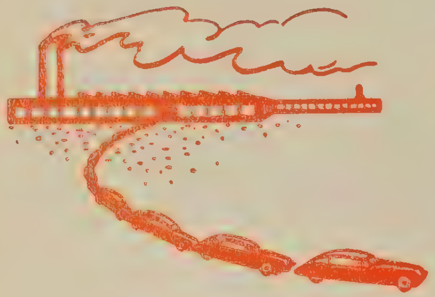
The demand for finer gauge full-fashioned stockings (50 million dozen pairs per year) has made higher machine speeds desirable. Use of magnesium in the needle bar, the largest vertically-moving part, saves about 2/3 the weight of the previous steel or iron bar, with less vibration and somewhat lower power consumption. But according to the Good company, Revere's chief contributions have been these: supplying uniform metals that can be finished to the closest tolerances, and working out the application of extruded shapes to reduce the amount of machining, making possible lower costs and a higher rate of production . . . Perhaps Revere can do as much for you. No matter what you make, why not ask the nearest Revere Office to send a man over to discuss the advantage of extruded shapes in your business?

REVERE
COPPER AND BRASS INCORPORATED
Founded by Paul Revere in 1801
230 Park Avenue, New York 17, New York
Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N.Y.—Sales Offices in Principal Cities, Distributors Everywhere.

Assembly Line . . .

WALTER G. PATTON

• Chevrolet's all-steel station wagon may be forerunner of the all-metal suburban car of tomorrow . . . Goodrich puts the atom to work in rubber research . . . Auto prices due to go still higher.



DETROIT—Don't rush madly into your favorite auto dealership and try to buy one, but it's possible—even at today's prices—to get a full size, all-steel station wagon without outside wood decorative effects for a "suggested" delivery price at Detroit of $1636 plus taxes and accessories. This includes a recent rise in prices effective late in June. Before the recent price jump the cost of this model was less than $1500.

Affectionately referred to by the workers at Chevrolet-Indianapolis who make the major stampings as "The Work Horse with Sex Appeal," the Chevrolet Suburban Carry-all is simply designed and strongly built. It is undoubtedly one of the best values in the industry today—if you can get one.

Curiously enough, the waiting line for the Chevrolet Suburban is probably shorter than the customer list for any other Chevrolet model. There's a reason, of course: At present the Suburban accounts for just a fraction over 1 pct of Chevrolet's total production and there is little prospect that the present schedule will be increased.

Also, Uncle Sam has found this particular model very useful and is taking a good share of the total output. Institutions, camps, feeder buses, surveying parties and dance bands are buying Suburbans at an accelerated rate. The few that are left are going to a growing number of suburbanites with a station wagon gleam in one eye and the other eye on their pocketbook.

There are other reasons, too, why you may have difficulty buying a new Chevrolet Suburban right now. For example, with steel extremely short this all-steel model weighing 3900 lb may be one of the first items to be slashed from the production schedules. Even more important, some Chevrolet dealers are not accepting orders for this model. The Suburban is not a Fisher Body product but is manufactured completely by Chevrolet's truck division.

The Chevrolet Suburban was first built as an experimental job in October 1936. Since then total output has never exceeded 3500 per year until this year. At present the production rate is about 1000 per month.

Specifications follow closely the material and engineering requirements for Chevrolet trucks. The standard 90 hp truck engine of 216.5 cu in. is used. A 3-speed transmission with steering column gear shift is specified. Wheelbase is 116 in. and overall length is 196⅝ in. The vehicle carries 8 passengers.

To provide riding qualities, many buyers are specifying double action shock absorbers and low pressure tires. These changes, coupled with minor adjustments in the springs, provide a soft ride for the passengers, according to Chevrolet engineers. The heavy duty rear axle, heavy rear axle housing and rear springs are said to be advantageous when pulling a trailer.

Channel beam side rails used are 5¾ x 2¼ x 9/64 in. The frame has five cross members. I-beam front axles are employed and semifloating rear axles with hypoid gears are specified.

Running boards are full length. There is a rear end gate and lift-type rear door. The tail light is designed so that it can be clearly seen when the end gate is down as well as when it is in the normal travel position.

OPTIONAL equipment includes a heavy duty clutch, a special 4-speed transmission with power takeoff opening and double acting shock absorbers.

The Suburban is a spacious vehicle. A distance of 7 ft is available in back of the driver's seat. The ceiling is 37 in. above the rear seat. Inside width at the rear seat is 51⅝ in.

Chevrolet-Indianapolis makes all the major stampings and subassemblies for the Suburban as well as Chevrolet trucks. The subassemblies are then shipped to the various Chevrolet plants for final assembly.

The major subassemblies built at Indianapolis include the roof, floor, side panels and doors. The floor of the Suburban is heavy plywood covered with Masonite and inserted in a sturdy steel frame. The roof is comparable to the Chevrolet panel delivery and is one of the largest stampings made by any auto producer.

Assembly of the side panels starts with the inner panel. After ribs and other reinforcing members are welded in place, all areas subject to corrosion are treated with moistureproofing compounds. Rubber pads are inserted at strategic points to eliminate rattles. In the final operation, a heavy sheet of vibration-resisting material is inserted to damp out vibration, eliminate noise and guard against "oil canning."

Complete subassemblies are then "nested" in sets in freight cars for shipment.

AT the Flint plant, Suburbans are handled on the regular truck line after the body is first put together on a special dolly.

After the floor is secured in the fixture, the cowl assembly is welded and bolted into place. At this point the emergency brake assembly is

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THREAD GAGES

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"THERE IS NO BETTER-PAYING INVESTMENT THAN THE RIGHT TOOLS FOR THE JOB" moved into place. After applying moistureproofing compounds the side panel assemblies are added. Rubber pads are inserted at a number of construction points. Before the roof is put on, a plastic compound is again used to seal off all openings. A total of 13 bolts is used on each side to fasten the top in place. The top is also welded to the side panels at several locations.

The next operation is to lead the joints. Following this the large side doors are added and the two-section rear door and tail light are attached.

After cleaning with mineral spirits the body is given a prime coat and baked. Following this the final coats of paint are applied and the body is ready to take its place in the assembly line.

Because of the unusually large number of trim operations, two extra workers are required to complete the job of inserting windows, adjusting hardware and performing other duties. Since extra time is required to complete these operations the Suburbans leave the regular truck assembly line at one point and are reinserted in the line when this special work is completed.

With all car manufacturers departing from wood construction for station wagons as rapidly as possible, steel producers should have a special interest in the design and construction of the all-steel station wagon. It is a safe prediction that once steel is available again the Chevrolet Suburban production schedules will be stepped up at a rapid pace. With more than 10 years experience in all-metal station wagon construction behind it, Chevrolet should be in an advantageous position in the intense competition that is expected to develop in this field.

* * *

THE atom is being put to work promptly by the rubber industry. Last week a second major rubber company, B. F. Goodrich, announced that it intends to study intensively the effects of atomic energy in rubber and related materials.

Goodrich scientists are apparently convinced that its new research center at Brecksville, Ohio, costing several million dollars will "make it possible to bring scientific discoveries to maturity three or four times faster than at present."

In addition to studying the application of atomic energy to rubber manufacture, Goodrich plans research into crude and synthetic rubber, and in the related fields of chemicals, plastics, agriculture and horticulture.

The main building is a three story structure 226 ft wide, 172 ft deep and contains 81 individual laboratories, an assembly hall seating 250, a cafeteria and a 10,000 volume library. Brecksville is a suburban community located midway between Akron and Cleveland.

PREVIEW: This station wagon may be the forerunner of the all-metal suburban car. Plant workers refer to it as "The Work Horse With Sex Appeal." Although the body follows closely material and engineering requirements for trucks, double action shock absorbers and low pressure tires provide riding qualities.

THE third round of wage increases brings with it some new auto price announcement with almost every passing day. Last week Ford announced increases in the list price of its new postwar trucks ranging from 4.5 pct on the six cylinder, ½ ton models to 10.4 pct on the 8 cylinder, cab-over-engine jobs. The corresponding dollar increase is from $40 to $148. Simultaneously, Ford announced that the recommended list price of Ford tractors has been increased from $1190 to $1230, f.o.b., Detroit.

Also last week, GM announced a boost of 5.9 pct in the list price of some of its replacement parts. According to the announcement, the upward price adjustments have been made "after studying the costs of each individual part."

According to GM statisticians, since the fall of 1940 the retail prices of the corporation's replacement parts have increased 46 pct compared to an increase of 70 pct in the consumer price index during the same period.

Since most sources are predicting that GM wages will rise again when the next U. S. price index number is announced, it is a good guess that GM is following consumer price indices fairly closely these days, and ought to know what it's talking about.

Court Decision Places Raw Material Purchase On Competitive Basis

Washington

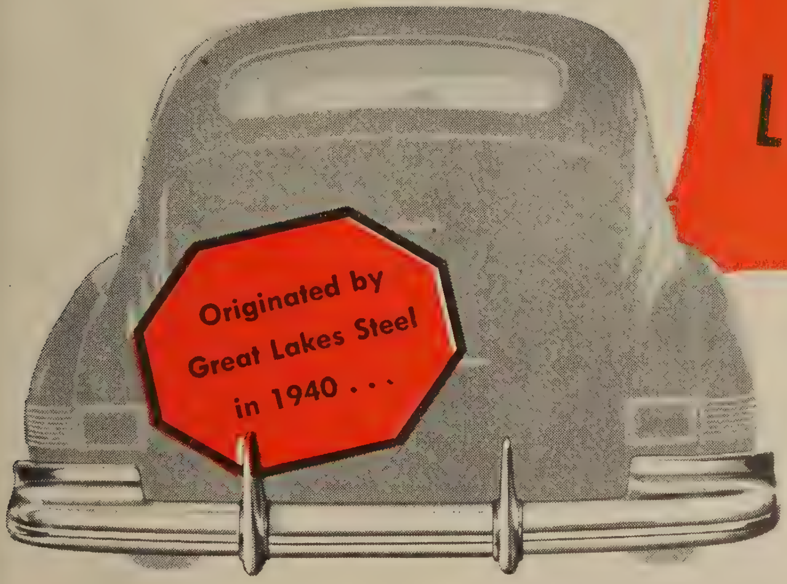
• • • **The Justice** Dept. has announced the successful conclusion of antitrust suit against the International Nickel Co. of Canada, Ltd., and its wholly-owned subsidiary, International Nickel Co., Inc.

The government's suit had charged monopolization and restraint of trade in nickel ores, nickel and nickel products. A final judgment, to which the defendants gave consent, requires International to sell, for a period of 20 years, basic nickel raw materials to producers of rolling mill products containing nickel.

Assistant Attorney General Herbert A. Bergson said he believes this requirement will "give potential competitors access to needed materials on a nondiscriminatory basis and thereby provide opportunities for competition in this important industry for the first time in more than 2 decades."

Another First for Great Lakes Steel

Cold-Stamped Bumpers OF High-Tensile Low-Alloy Steel



Universally used in 1948

Over eight years ago the Great Lakes Steel Corporation applied N-A-X HIGH-TENSILE STEEL to the first cold-stamped automobile bumper. This represented the first practical application of high-tensile, low-alloy steel to the passenger car industry.

Today, passenger car manufacturers have universally recognized the superiority of cold-stamped bumpers which utilize the high strength, good formability, and better surface texture of high-tensile steel. Four out of five cars built today have them as original equipment — concrete evidence of the economic value of this Great Lakes Steel contribution to the automotive industry.

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Washington . . .

EUGENE J. HARDY

• New law sets stage for cleanup of polluted streams . . . Cost to industry will be heavy . . . Government will toss $100 million into kitty.

WASHINGTON — Industry will have to shell out millions of dollars within the next 5 years to treat polluted waters flowing from mines and factories into the nation's rivers.

Federal control of stream pollution, a highly controversial issue in Congress for almost half a century, was finally approved in the last few days of the recent session of Congress. And President Truman's signature on the bill served as a green light for the Federal Works Agency and the Federal Security Agency to begin plans for cleaning up the streams and rivers in industrial areas.

One of the principal targets of pollution-control advocates is that section of the Ohio River extending from Pittsburgh to Cincinnati. For years, the waters discharged from mills, mines and factories in this area have found their way into what passes for drinking water in Cincinnati and other down stream municipalities.

Now, the federal government is stepping in with a $100 million kitty which will be made available to state and local governments for construction of treatment works. The actual appropriation of funds won't come until the new Congress convenes in January. But meanwhile, the federal agencies concerned are going ahead with plans for preliminary surveys, since there is little doubt but what the necessary appropriation will be approved by both Senate and House.

Industry representatives told Congress during lengthy hearings on pollution-control bills that the cost to mining and manufacturing industries of treating disposal waters would probably "run into hundreds of millions of dollars."

HERE'S what will happen under the new law: "The federal government makes a survey and finds that a mine, mill or factory is discharging polluted water into a stream or river. The government then tells the polluter to stop it, and suggests ways of going about it. The polluter can then turn to state or local government for assistance. The law authorizes the federal government to file suit against noncooperators, but such suits can only be instigated with the approval of the state having jurisdiction over the streams or rivers involved.

The Senate originally had passed a bill authorizing federal loans to industry for the purpose of carrying out abatement measures, but this provision was knocked out in the final draft of legislation. Although almost every Congress since 1900 has tackled the pollution control problem, only once before has a bill progressed as far as the White House. That was in 1940, when President Roosevelt decided that such legislation was not in the public interest and that a presidential veto was in order.

Federal Works Administrator Philip B. Fleming points out that corrective action has been slow for a number of reasons. In many cases, the cost was beyond the reach of state and local governments. Then, too, abatement cannot generally be carried out completely by any one city, one county, or one state. Pollution control requires joint action by all concerned, plus the assistance of the federal government.

MR. Fleming is careful to point out that it should not be inferred that private industry is unacquainted with the problem. "Research studies on the part of many groups of technicians, on behalf of both public and private bodies, have contributed much to the methodology of stream pollution abatement," he says.

"Problems in the treatment of industrial wastes have increased with the growth of industry. Proper disposal of such wastes is generally accepted as a responsibility of the process of production. To this end, we needed further research into the technical methods of treatment of industrial wastes," he points out.

The Merrimack River, in New England, is another prime example of the need for governmental control of pollution. Taking this river as an example of a typical body of water in an industrial area, Mr. Fleming points out that it receives considerable quantities of wastes from metalworking plants, cotton mills, leather processing plants, paper mills and wool mills.

Through FWA, grants now can be made to municipalities contributing pollution to the streams for the preparation of plans and specifications for treatment works. Similarly, loans could be made, if needed, to assist in the financing of these works. In this case, an equitable share of funds would be allocated to the two states of Massachusetts and New Hampshire for investigations and research on pollution by industrial wastes.

UNDER the new law, the federal government could, with the consent of the state or states in which pollution is discharged, initiate a suit to provide abatement, if the states or interstate agency involved do not secure such abatement. Recent strengthening of the Massachusetts stream pollution control laws already has resulted in steps being taken toward abatement of pollution in Massachusetts.

Loans to be made by FWA for construction of treatment works can be made only after the pro-

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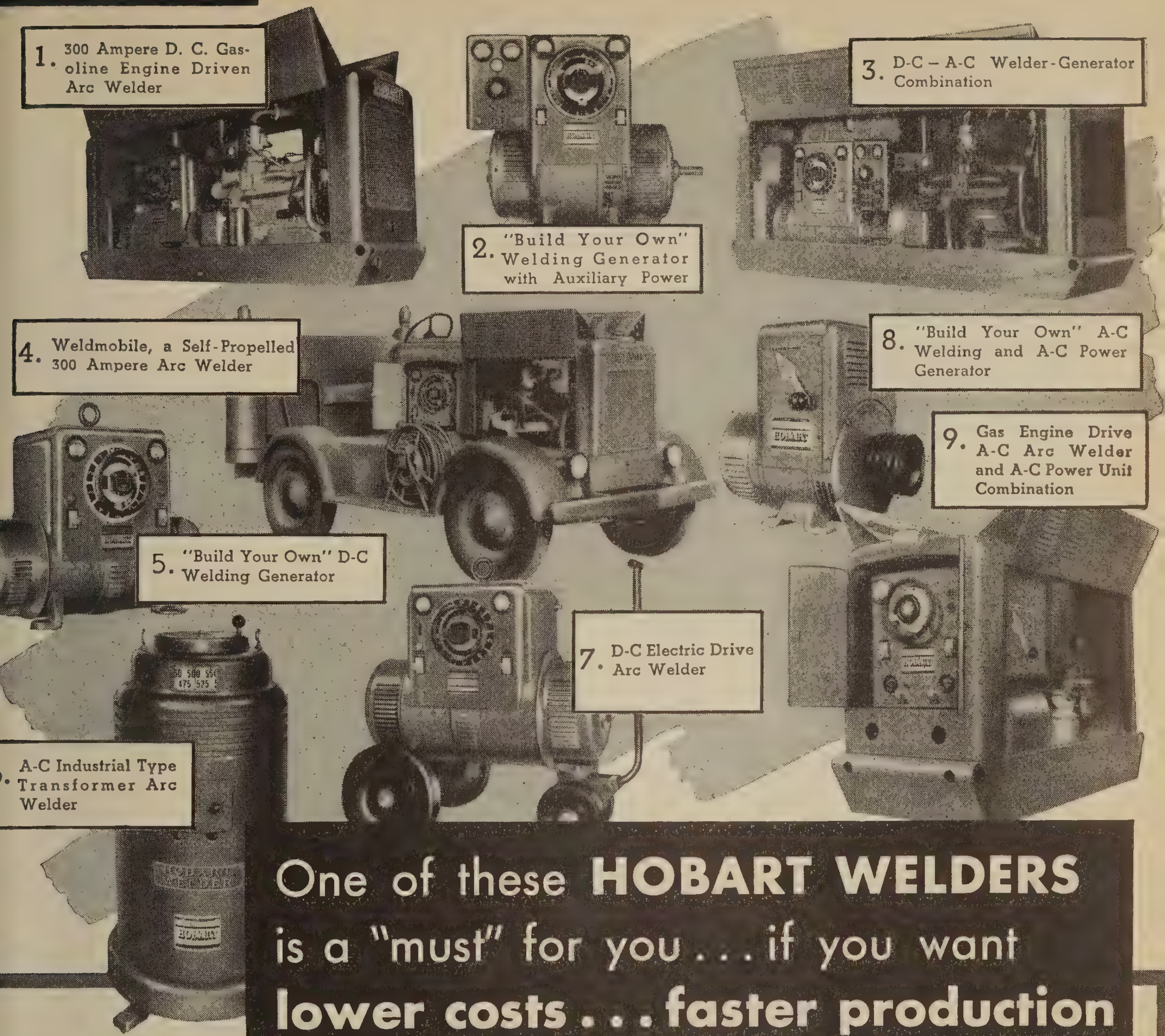

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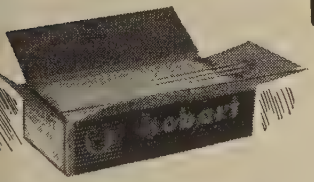

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posed project has been approved by the appropriate state agency and by the U. S. Surgeon General. The latter is a Federal Security Agency office. No loan may be in an amount in excess of one third of the estimated cost, or in excess of $250,000, whichever is smaller. Loans are to bear 2 pct interest.

Funds are to be appropriated to FSA for each of the 5 fiscal years between July 1, 1948, and June 30, 1953, in sums not to exceed $22.5 million, for the purpose of making such loans. In addition, FSA is to receive during each of these fiscal years the sum of $1 million to be allotted to states for research, studies, investigations and surveys. Similarly, grants up to $1 million for each of the 5 fiscal years are authorized for state engineering and planning.

Coal producers have estimated that the new law will add 50¢ to the cost of each ton of coal mined. Steel spokesmen say that the cost of producing pig iron will rise about 65¢ a ton under the new law, and that the cost of finished steel will be increased by at least 1 pct.

AT any rate, the old truism that government controls increase the cost of doing business still holds. And, despite political promises, the creeping paralysis of government controls appears to be a well-nigh incurable ailment of both legislative and executive branches of government.

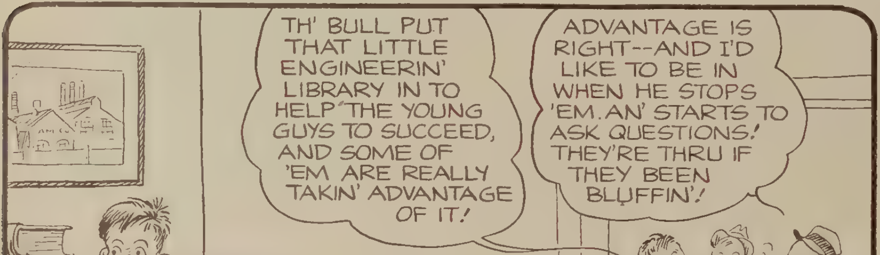
The National Coal Assn. fought vigorously in Congress for state control of pollution as opposed the federal control. The association told the House Public Works Committee, during hearings on the federal control measure, that the problem is "a local matter within the purview of the states."

"The bituminous coal industry is proud of its production record, particularly in the war years," the association stated. "We are confident that we can continue to do our part in fueling America if we remain unhampered by the drastic rules and regulations as proposed here. Coal mine drainage pollution may be a problem, and if so, steps to its solution already are being taken.

Progress is being made and progress will continue to be made if industry is permitted to proceed with the existing proper approach to its problem," the association testified.

"Let the record be clear," the group told the House committee. "The bituminous coal industry does not oppose the abatement of pollution of any type, but it does believe that it is a local problem which should be handled by the individual states, or by compacts where one or more states are involved, and it is not one which should or could be solved by the creation of another bureau for the issuance of bureaucratic rules and regulations."

THE BULL OF THE WOODS BY J. R. WILLIAMS


TH' BULL PUT THAT LITTLE ENGINEERIN' LIBRARY IN TO HELP THE YOUNG GUYS TO SUCCEED, AND SOME OF 'EM ARE REALLY TAKIN' ADVANTAGE OF IT!
ADVANTAGE IS RIGHT--AND I'D LIKE TO BE IN WHEN HE STOPS 'EM AN' STARTS TO ASK QUESTIONS! THEY'RE THRU IF THEY BEEN BLUFFIN'!
SHOP PRACTICE
7-16
MARKED MEN
J. R. WILLIAMS
COPR. 1948 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

Monthly Car-Building Goal Reached For First Time Since March 1947

New York

• • • **Domestic freight** cars delivered during June totaled 10,387 the American Railway Car Institute has announced here. Total deliveries for the half year have been 55,345. Of June deliveries, 7737 were from the car builders and 2650 were built in railroad shops.

In announcing that the 10,000 cars monthly goal had been achieved for the first time since the current car building program was planned in March 1947, S. M. Felton, president of the American Railway Car Institute, states that "Despite the achievement of a peak month, the outlook for the future is just as 'discouraging' as was indicated by Col. J. Monroe Johnson, director of the Office of Defense Transportation, in his statement on June 29.

"Last month's production reflected exceptionally high steel receipts in March, after the usual time lag for fabrication and assembly of cars.

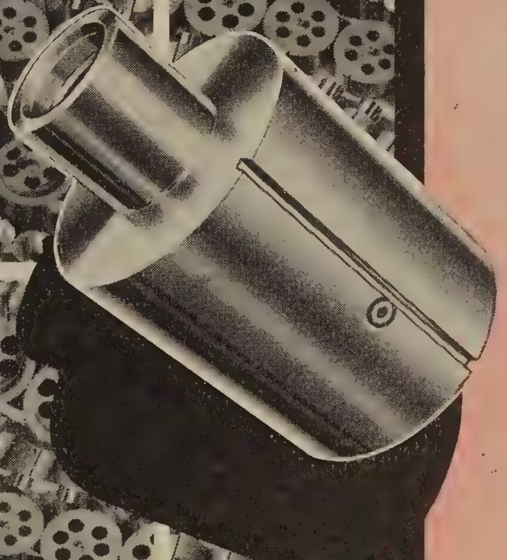
"Because steel receipts have dropped since, it is most unlikely that the 10,000-car level can be maintained during the months immediately ahead."

June deliveries, the Institute announced, included 3361 box cars, 4069 hoppers, 701 refrigerator, 981 gondola and 698 tank cars.

Orders placed during the month were: with the car builders, 5623 cars; in railroad shops 250; total, 5873. Total orders for the half year, 58,168 cars; as compared with 64,363 during the first six months of 1947.

Cars on order as of June 30 totaled 122,167, as compared with 109,006 one year earlier.

Thousands of 'em!



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West Coast . . .

ROBERT T. REINHARDT

• Traffic study just released should interest iron and steel producers and fabricators in the Mountain-Pacific areas . . . Southern California metal men oppose any allocation plan.

SEATTLE—Producers and fabricators of iron and steel in the West, now confronted with new shipping problems developed by the probable elimination of the basing point system and higher freight rates, will be especially interested in a study just released by the Bureau of Economic and Business Research, State College of Washington entitled "Interregional and Intraregional Traffic of the Mountain-Pacific Area in 1939." This voluminous and comprehensive study is based on 1939 shipments but according to competent traffic men it reveals for the first time the actual picture. The report was planned and directed by James C. Nelson, formerly chief, transportation division, Office of Domestic Commerce, who is now a professor of economics at State College of Washington. A large part of the work was done by the U. S. Dept. of Commerce and required several years to compile.

While the report covers practically all products it is of especial interest to the iron and steel industry in Washington, Oregon, California, Idaho, Montana, Utah and New Mexico.

The study is based upon a carload waybill traffic sample for 1939 which was made by the Board of Investigation and Research, a temporary advisory research agency established under the Transportation Act of 1940. The authors point out that while the waybill compiled by the board represent only carload shipments terminated by class one railroads during one day each month in 1939, authorities report that the traffic volumes represented by these waybills was a sufficiently high percentage of the total, and that the sample was made with such care that a reasonably accurate state-to-state traffic pattern for the year is available.

The movement from state to state is reported for 156 commodities and for the first time in such a study, internal freight movements within states and the Mountain-Pacific area are charted. In addition there are useful maritime shipping statistics to, from and within the area, giving both inbound and outbound tonnage, especially on iron and steel items on a port to port basis.

The Mountain-Pacific area was selected for the first of what may be a nation-wide study because of the rapidly growing western industrial economy, particularly in iron and steel and light metals manufacture; the interest displayed by western individuals and groups struggling with a variety of research problems relating to western markets and industrialization; and the fact that transportation factors are of such importance to the far West so distant from the center of population and industry.

While the Mountain-Pacific rate territory as shown during 1939 omitted parts of Montana and Utah and included a part of New Mexico, the waybills were tabulated by states and therefore there is a slight discrepancy between the two areas. However, in the results tabulated it is shown that there was only a slight variation when the two areas were compared on samples.

IN order to expand the waybill sample to an annual total for the country as a whole the BIR developed a set of factors for each of the 156 commodities studied. It is pointed out that there are limitations to the use of these factors since they were developed on a national basis and hence apply with greater accuracy if limited to that level and to a lesser degree if applied to a localized area. The accompanying table shows the actual tonnages terminated by the principal transcontinental rail carriers in 1939 and also gives for comparative purposes an estimate of iron and steel tonnage terminated by the same carriers which was obtained by expanding the 12-day waybill sample to an annual basis.

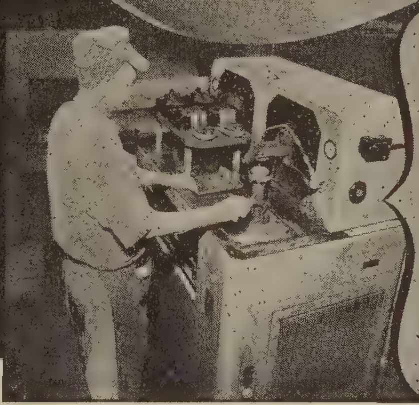
It will be noted that the actual termination of iron and steel products by these rail carriers did not differ substantially from the total obtained by expanding the sample. There is however a considerable variation in the actual termination in the southwest and in the northwest as compared to those indicated by the expanded sample. The conclusion is reached that commodity groups expanded on this basis to large areas from the sample traffic area on a safe premise.

Among the data developed by this study are the reports that in 1939, 1,014,649 long tons of iron and steel were delivered to the Mountain-Pacific area by water; that approximately 64 pct of iron and steel items are brought into the Mountain-Pacific area by rail; trucks carried approximately 2,201,058,000 ton miles of manufactured and miscellaneous products during 1936; and a great many tables giving detailed reports on shipments within the western territory for each of 156 commodities.

The report is a mine of information for any manufacturer interested in market analysis or market trands. The books are available from the Bureau of Economic and Business Research, State College of Washington, Pullman, Wash, at a price of $2 each.

LOS ANGELES—Although President Truman has indicated that he does not plan to exercise his authority to establish a compul-

Cuts HARDENING COSTS 80%



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TOCCO-hardening trolley wheels for overhead conveyor trolleys.

(Photo—Courtesy Link Belt Co.)

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IN your search for sound ways to cut costs, don't overlook the very satisfactory results you can get by TOCCO induction hardening, brazing and heating for forging. Savings effected by TOCCO-hardening of the conveyor trolley wheels shown here are typical of hundreds of cases. Note these benefits:

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TOCCO engineers are glad to survey your operations, without obligation, of course, for similar cost-cutting possibilities.

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sory steel allocation program unless industry gives signs of failing to cooperate on a voluntary basis, the local Chamber of Commerce has appointed a committee headed by Morris B. Pendleton, president of Plomb Tool Co., to register opposition to any further allocation program.

The organization is planning to protest to the U. S. Dept. of Commerce and the steel industry advisory committee in the hope that a temporary interruption in the allocation program may be established. Mr. Pendleton's committee is to make a study of the present allocation program and its repercussions on local business and the hope has been expressed that before further allocations were made a survey of the total steel requirements of American industry would be made.

Encouraging to the steel-short manufacturers in this area was the report of Kaiser Co., Inc. that all existing records in steel ingot production at the Fontana plant had been broken during May when 80,103 net tons were produced as against the best previous month's tonnage of 77,578. Another record was broken by this plant in the same month when 61,184 net tons of finished mill products were shipped. This tops the old record of 53,519 net tons which was established in December 1947.

Finished steel of all kinds, however, remains critically short in this area and recently there has been a little flurry in the gray market for nails. An eastern producer has offered buyers both here and in San Francisco a bright wire nail from 6-penny to 20-penny at $10.75 per 100 lb. in 5000 keg lots f.o.b. New Jersey.

At these prices there is apparently a practically unlimited supply available but western buyers are not grabbing this merchandise too rapidly since to these prices must be added approximately 15¢ per 100 lb for delivery to dockside plus about 72¢ per 100 lb water freight.

By the time these nails pass through the hands of the supply house and retailer, the man in the street would probably be paying around $18.00 or $19.00 per 100 lb.

SAN FRANCISCO—Small industries of northern California have banded together to form a new trade association with a purpose of developing more sources of subcontract work; to develop more outlets for the products of members; to open channels to material and equipment at more favorable prices for the small manufacturer; and to work for the more efficient and economical operation of small plants.

Donn Sigerson is the association president and also president of the All Work Mfg. Co., of Oakland; vice-president, George Smedborg, Associated Lighting Service, San Francisco; secretary - treasurer, Kyle Van Nest, Precision Machine Products Co., Alameda.

An advisory committee made up of executives of Bay Area Chamber of Commerce and industrial companies has also been named. Membership is to include companies producing machine work, stamping, plastic moulding, die-casting, sand casting, forging, industrial finishing, welding and sheet metal, electrical and woodworking, and others.

A new steel foundry will soon be in operation in south San Francisco according to Charles Hoehn, Jr., president of the Superior Electrocast Foundry Co.

Erection of a new building has been started on a 5 acre site near the plants of Bethlehem Pacific Coast Steel Co. and Metal & Thermit Corp. Soule Steel Co. of San Francisco is putting up the structural steel frame building which is 100 x 125 ft and when completed the plant is to cost approximately $200,000 and will employ about 40 persons.

Crook Takes A Truck Load

Detroit

• • • **Next time** he hauls steel from Kaiser-Frazer's warehouse at Adrian, John Potestivo, Detroit truck driver, is going to ask the family baby sitter to stay all night with the steel.

Arriving too late Saturday night at the Budd Wheel Co., Detroit, Potestivo parked the $4600 load of steel in front of his home in Highland Park and went to bed. Up early the next morning, he found the trailer gone.

The empty trailer was later recovered about 5 miles from the spot where it was taken. According to police the thieves apparently hooked up their own tractor and hauled away the 24-ton load of steel.

Comparison of Actual Iron and Steel[1] Tonnage Terminated by Principal Transcontinental Rail Carriers in 1939 with Estimated Tonnage for the Same Carriers Obtained by Expanding 12-day Waybill Sample to an Annual Basis[2]

Commodity Class No.	Commodity Class	1939 (I.C.C. Data)						1939 (Estimated from 12-Day B.I.R. Sample)					
		Southwest[3]		Northwest[4]		Total, Terminations		Southwest[3]		Northwest[4]		Total, Terminations	
		Short tons	Per-cent	Short tons	Per-cent	Short tons	Per-cent	Short tons	Per-cent	Short tons	Per-cent	Short tons	Per-cent
490	Iron, pig	67,203	5.24	27,007	4.27	94,210	4.92	26,830	2.45	26,395	2.97	53,225	2.68
491	Iron and steel, rated 6th class, n.o.s.	9,011	.70	8,409	1.33	17,420	.91	1,489	.14	2,252	.25	3,741	.19
500	Rails, fastenings, frogs and switches	31,641	2.47	38,076	6.02	69,717	3.64	63,057	5.76	170,840	19.28	233,897	11.81
510	Cast-iron pipe and fittings	40,660	3.17	27,159	4.30	67,819	3.54	34,254	3.13	25,466	2.87	59,720	3.02
511	Iron and steel pipe and fittings, n.o.s.	269,052	20.96	108,470	17.15	377,522	19.70	147,936	13.52	150,265	16.96	298,201	15.06
512	Iron and steel: nails, and wire, not woven	110,167	8.58	41,627	6.58	151,794	7.92	96,498	8.82	53,639	6.05	150,137	7.58
513	Iron and steel, rated 5th class, n.o.s.	755,747	58.88	381,771	60.35	1,137,518	59.37	723,971	66.18	457,480	51.62	1,181,451	59.66
	Total	1,283,481	100.00	632,519	100.00	1,916,000	100.00	1,094,035	100.00	886,337	100.00	1,980,372	100.00

1. An undetermined amount of iron and steel products carried by these railroads terminated outside the Mountain-Pacific States.
2. Estimates of 1939 tonnage were expanded from 12-day BIR sample by using factors computed by BIR for the whole United States.
3. Includes traffic terminated by A. T. and S. F., Southern Pacific (Pacific lines) and Western Pacific.
4. Includes traffic terminated by Great Northern, Northern Pacific and Union Pacific. Excludes C. M. St. P. and Pac., because analysts familiar with waybill data believe that a high proportion of its tonnage terminates outside Mountain-Pacific States.

Source: Interstate Commerce Commission Statement No. 40100, Freight Commodity Statistics, 1939, and Board of Investigation and Research, Carload Traffic Study, 1939.

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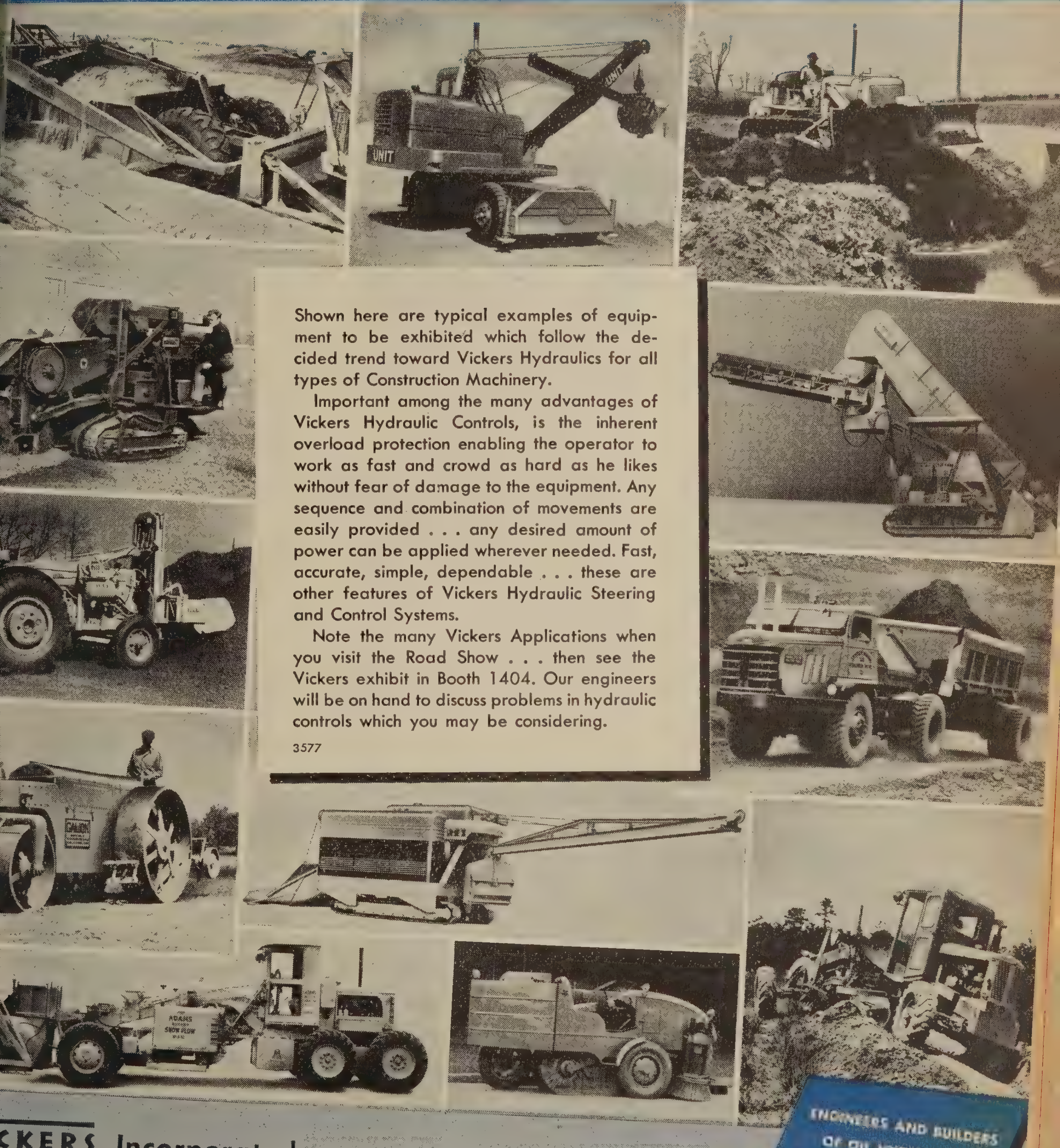
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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Shown here are typical examples of equipment to be exhibited which follow the decided trend toward Vickers Hydraulics for all types of Construction Machinery.

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PERSONALS

• **J. Louis Reynolds,** manager, Aviation Div., Jack & Heintz Precision Industries, Inc., Cleveland, has been elected vice-president. Mr. Reynolds joined the firm in 1946 as assistant to the vice-president in charge of engineering, later assuming active direction of the newly-formed Aviation Div.

• **George A. Stevenson** has been elected vice-president in charge of production, Penn Metal Co., Inc., at the Parkersburg, W. Va., plant, succeeding **A. Vall Spinosa,** who has retired as executive vice-president. Mr. Spinosa will continue to serve in an advisory capacity. Mr. Stevenson comes to Penn Metal from Ames Baldwin Wyoming Co., where he has been assistant to the president. **Hugh Gallaher,** vice president of Penn Metal and director of export sales since 1931, has been appointed director of domestic and export sales.

• **Gastan M. Zucco** has been named contracting manager for Bethlehem Pacific Coast Steel Corp.'s fabricated steel construction division, for the four Northwest states. Mr. Zucco has been affiliated with Bethlehem in the Northwest since 1927.

• **Hampton Robb** has been appointed executive vice-president of Aerol Co., Inc., Los Angeles. **Albert J. Freitag** has been named treasurer. Mr. Robb comes to Aerol from National Biscuit Co. Mr. Freitag was formerly associated with California Bank of Los Angeles and the Federal Reserve Bank of Chicago.

• **John K. Killmer,** who has served Bethlehem Steel Co., Inc., Bethlehem, Pa., in various capacities since 1923, has been appointed metallurgical engineer on the staff of the operating vice-president to succeed **Henry Wysor,** who has retired.

• **Francis W. Sheppard** has been elected vice-president in charge of sales, Woodward Iron Co., Woodward, Ala., succeeding **John B. DeWolf,** who has retired. Mr. Sheppard was formerly associated with Harbison-Walker Refractories Co. as general sales manager. He will maintain offices in Birmingham.

• **William J. Thomas** has been appointed general sales manager of Babcock & Wilcox Tube Co., Beaver Falls, Pa. Mr. Thomas has been assistant general sales manager since 1942.

° ° °

FRANK B. RACKLEY, general manager of sales, Jessop Steel Co.

• **Frank B. Rackley** has been appointed general manager of sales, Jessop Steel Co., Washington, Pa., succeeding **T. W. Pennington,** vice-president, who recently resigned. Mr. Rackley was formerly associated with Carnegie-Illinois Steel Corp.

• **Davis D. Cox** has been appointed superintendent of the By-Product Coke Dept., Tennessee Coal, Iron and R.R. Co., Birmingham, succeeding **John J. Phillips,** who has retired after more than 40 years with the company. **Oscar H. Wilson** has been named assistant superintendent of that department, succeeding Mr. Cox and **David P. McMillan,** superintendent of ovens and unloading station, succeeding Mr. Wilson.

• **Radcliffe L. Romeyn,** who for the past two years has served the Philco Corp., Philadelphia as factory export manager, continues in this capacity with the added responsibilities of his new position, vice-president of the International Div., to which he has been appointed. Mr. Romeyn joined Philco in 1945 as merchandising and sales promotion manager for the export division.

• **F. H. Gordon** has retired as vice-president of Lukens Steel Co., Coatesville, Pa. Mr. Gordon joined the sales department of the firm 53 years ago and after filling various clerical positions he was named successively assistant general sales agent and general sales agent. He was elected vice-president in 1928. **Donald M. Willard** has been appointed superintendent of the construction department of Lukens, succeeding William C. A. Busch, who died. **Roland R. Trask** has been named assistant superintendent of that department and **Albert M. Kuhn** assistant to the superintendent, in charge of masonry. Mr. Willard joined Lukens 22 years ago and was formerly assistant superintendent of the construction department. Mr. Trask has been construction engineer with the company and was formerly connected with Bethlehem Steel Co., Inc. Mr. Kuhn has also been with Lukens 22 years, starting as a bricklayer and until his new appointment was foreman in the masonry department.

• **Gordon W. Matthews** has been named jobber sales representative for Milcor products, Inland Steel Products Co., Milwaukee, Wis., covering the southeastern portion of the United States, with his headquarters in Atlanta.

• **John E. L. Duquet** has been appointed member of the board of directors, Montreal Locomotive Works, Ltd., Montreal, Canada, to fill the vacancy created by the death of **Col. J. L. Ralston.**

• **John B. Carlock** has been appointed chief consulting engineer for the Loftus Engineering Corp., Pittsburgh. Mr. Carlock recently retired as chief engineer of plants for the Jones & Laughlin Steel Corp.

• **Carl W. Volz** has been elected vice-president, Electro Metallurgical Co., a unit of Union Carbide & Carbon Corp., New York. Mr. Volz has been with the organization since 1913, and is an officer and director of several other corporaion subsidiaries.

• **Peter F. Rossmann** has been elected president of the Symington-Gould Corp., Rochester, succeeding J. A. Sauer, who will continue as a director and chairman of the finance committee. Mr. Rossmann was formerly assistant to the president of Curtiss Wright Corp.

(CONTINUED ON PAGE 144)

..a hole in your pocket?

Are you overlooking the holes in your "plant's pocket" . . . the little day-to-day losses that add up to big money?

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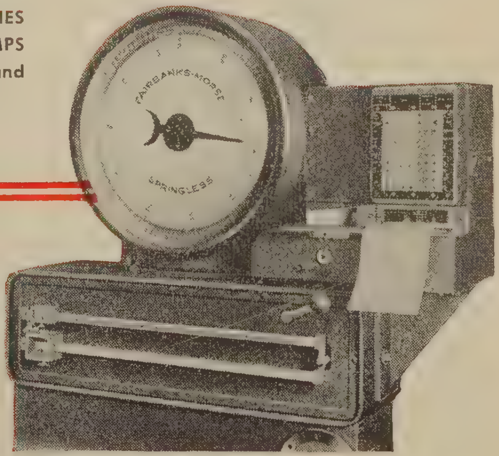

European Letter . .

• Tito's defiance of Russian domination said to be real cause of expulsion of Jugoslavia by Cominform . . . Moscow party line charges heresy and ideological impurity.

THE news that Marshal Tito and his closest political associates have been disowned by the Cominform and cast out of the brotherly solidarity of international communism has broken on the outside world like a great clap of summer thunder. Of all Russia's supposed satellites, Jugoslavia had the reputation of conforming most exactly to the Soviet pattern and of adopting with the greatest ruthlessness the policy of out and out hostility to the western world. Jugoslavia was no fringe state of the Russian sphere of influence, lately won by force or fraud to Communism. On the contrary, Tito and his communists won their influence in hard fighting against the Germans. In casting Jugoslavia out, Moscow admits that heresy has struck at the very foot of the papal throne.

The utter unexpectedness of so deep a crisis is a measure of the difficulty of finding the reason for it. Looking back, wise after the event, one can recall the dismissal in the spring of the Jugoslav Communist leaders, Hebrang and Zhujovitch, which was regarded at the time as an internal squabble. There may have been some connection between the outlawing of Jugoslavia and the rebuke administered by Moscow to Dimitrov, the Bulgarian leader, for his proposal earlier in the year of an east European federation, a scheme Tito was known to approve. Now it appears that a battle royal has been raging within the Cominform since the early spring, with accusations and counter-accusations, with demands for repentance and recantation and indignant counter-denials and defiances, the Russian Communists leading the attack, the Jugoslav Party strenuously resisting. When the Cominform parties finally met in order to discipline the recalcitrant Jugoslavs, they refused even to be present. The riposte was excommunication. Yet on the surface all has seemed calm. What, then, is the explanation for the whole astonishing crescendo of bitterness and disagreement and spite?

AT first glance, there seems little guidance to be found in the published accusations. The Cominform articles of excommunication make up an astonishing document in which, in language recalling the *ex cathedra* statements of some narrow and fanatical religious sect, every accusation from nationalism to Trotskyism, from megalomania to ideological inexactitude is hurled at Marshal Tito's head. The chief accusations are that the emphasis put on the Popular Front in Jugoslavia, in which bourgeois elements are admitted, has weakened the position of the Communist party proper; that the regime has coddled the peasants at the expense of the proletariat and delayed necessary measures of collectivization; that the Jugoslav regime is addicted to "nationalist chauvinism" and that it has been frightened by the western imperialists into seeking an orientation towards capitalism.

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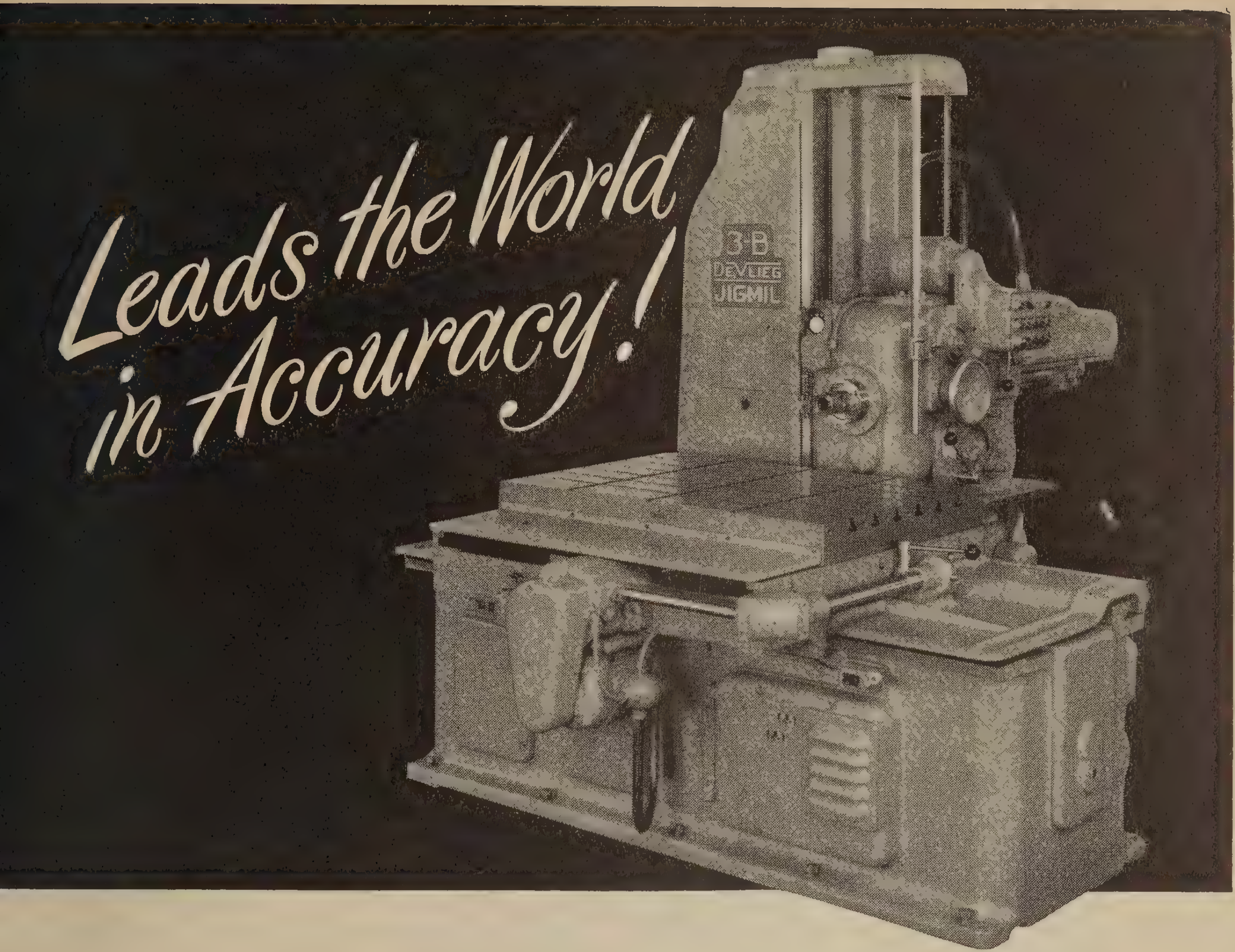
This is the essence of the attack. Take first of all the issue of the Popular Front. In form, the Front has appeared to mask the Communists. In effect, it has been the means whereby all rival parties have been swallowed up. Nowhere has the policy of building up mass organizations with Communists in key positions been pushed more recklessly than in Jugoslavia.

The attacks on Jugoslav peasant policy are of some interest since they reflect Russia's general uneasiness over the political reliability of the east European peasants. There are some signs that the Soviet Union would like to speed up the process of collectivizing agriculture throughout its sphere of influence. Yet here again the accusation against Jugoslavia hardly rings true, for in the same breath in which the Russians criticize Jugoslav dilatoriness, they attack the recent measures introduced in Jugoslavia to encourage nationalization and to check private trade, measures which in fact have put the Jugoslavs at the head of the east European campaign for collectivization.

NINE-TENTHS of the Cominform's crime sheet is either irrelevant or inaccurate. Nevertheless, in spite of all the fuddle and nonsense, the document ends by betraying what is almost certainly the true explanation—that Tito is being expelled not for heresy, but for insubordination, not for ideological impurity, but for defiance of the Moscow line. This likelihood is borne out first of all by the tone of the whole indictment. It breathes outraged dignity from first to last.

Tito has become weary of Soviet tutelage. He, the most colorful, the most military, the most adventurous, the most dangerously popular of the leaders of European communism, has also rebelled most sharply against Russia's attempt to dominate totally the policy of its satellites. It is impossible to establish on which point the actual break came, on Trieste or Carinthia or Balkan Federation or even, just possibly, on Marshall aid—but the precise issue is hardly the vital point. The decisive fact is that the Russian yoke has come to seem altogether too oppressive, that Communist Russia can take on an imperialist look even to the Communist Balkans.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Industrial News Summary...

- ***Steel Wage-Price Hike Due***
- ***F.O.B. Mill at Same Time***
- ***Scrap Market Still Jittery***

THIS is a red letter week for steelworkers and steel consumers. The workers will get a "good" raise in pay with a security package. The steel customers will get the biggest bump in prices seen in years. But this time the steel industry trails the parade in the third round of wages and prices. In former periods it was away out in front.

Steel leaders have admitted defeat in the wide scale anti-inflation drive initiated by the United States Steel Corp. Now this week the promise to raise wages and adjust prices if its plan failed will be kept by Big Steel. The rain of wage and price increases has been so swift in recent weeks that the band wagon has almost passed by the steel industry. But it will hop on.

Steel prices will be announced at the same time some steel companies advise their customers that they have formally gone to an f.o.b. mill price system. The increases will be substantial—much larger than at first thought. U. S. Steel which cut prices deeper and on a wider variety of products than most other large companies will likely advance prices by the greatest amount. They may raise the ante as much as ½¢ a lb or $10 a ton.

Reasons for such advances are not hard to find. The cut in prices made more than a month ago was an experiment in throwing money away to see if a deflationary trend could be generated. It failed.

IN addition to the restoration of the price cuts the rest of the price increase will take care of (1) coal wage hike which some say will mean $1.25 and more a ton on finished steel (2) the steel wage increase that might be as much as 16¢ which would include the straight increase per hour plus insurance, etc., (3) increase in cost of items sold to the steel industry which are now on an f.o.b. mill basis and thus include freight formerly paid by the producer and (4) accumulation of freight increases paid by the steel industry on raw materials which were not covered in any previous price increases.

Even with the latest price advance to come the steel industry will not have matched the increases made in prices by other industries. It is believed that any windfall to steel companies because of the abandonment of the f.o.b. basing point system will be considered when companies finally figure out their new selling prices.

When prices are announced by a few companies this week and by more next week the steel trade will find itself in one of the most confusing periods in steel history. Not only will mill prices be established at most every point of production as predicted by THE IRON AGE two weeks or more ago—but each of these new points will be accompanied by a new and substantially higher price than heretofore. It will take the well known Philadelphia lawyer to figure all this out. Steel salesmen will be expected to be a walking calculating machine and a memory tester on freight rates.

STEEL consumers this week are taking night courses at home and in offices studying freight rates and trying to find out where their best bargain lies. Chances are they won't find bargains. Steel is hard to get and they will for the time be paying the freight without much more than a grunt. When times change it will be a far different story.

When Philip Murray's steelworkers get their long awaited and once jettisoned pay raise, worker morale should shoot up. It hasn't been at top level as the wage parade passed them by. Increased salaries are also coming to the white collar steelworker.

While steel people were poring over tentative price schedules for their companies and mopping their brows over the avalanche of confusion the f.o.b. mill system will cause, the scrap market was kicking up. Once again the price moved up at Chicago while other areas feebly held to the so-called formula prices with little in the way to point to as large tonnages.

There were also rumbles below the surface that the so called formula prices which involved the informal use of a hastily thought-up basing point system for steel scrap was on the ropes. Some people said that if it was illegal to sell new steel on a multiple basing point basis, then it was illegal to sell old steel that way. Time will tell on this if the inflationary movement in scrap prices does not do the deciding quickly.

THE IRON AGE steel scrap composite rose this week 9¢ a gross ton, reflecting the increase at Chicago. It now stands at $41.00 a gross ton and is nearing the high for this year. It is still $2.58 a gross ton below last year's high in the week of Oct. 28.

Pig iron advances will follow steel in addition to those already made last week. Some companies raised $4.00 a ton. Others may boost the price more. Many steel companies have been charging much more for steel products than the major firms. After the wage increase they will raise prices higher. This will mean one of the widest variations in steel prices both as to location and product that the industry has ever seen.

The ingot rate this week is established at 92 pct, up one point from last week's revised rate of 91 pct.

The real wallop to result from the f.o.b. system of steel pricing will come when steel users pass on the added freight to their consumers. Some makers of finished manufactured goods will have to add a terrific amount to their selling costs. Their freight for certain types of steel will be substantial. Many of their sources are far removed from steel centers. If they want the steel they have to pay the freight.

FOLLOWING SUIT—Bethlehem Steel Co. abandon-d the multiple basing point system of selling steel ef-ective July 9. Now mill bases will be used for selling and istributing rolled steel products. In announcing the hange Eugene G. Grace, company chairman, said, "It is egrettable that the law requires the abandonment of a ong established pricing policy which much of the industry f the country has built. The change is sure to result in erious handicaps on many users of steel products due to heir location. Large investments in processing plants are ertainly placed in jeopardy." It is a foregone conclusion hat all other steel producers will follow suit.

VIOLATION—The National Labor Relations Board as stated that John L. Lewis and the UMW have violated he Taft-Hartley Law by their demands for a union shop. The NLRB said it will seek an injunction immediately to orce Lewis and the UMW to start mining coal. The Board vill hold a hearing on its charge on July 20. Lewis and the JMW had 10 days to reply to the NLRB charge.

FERROALLOYS F.O.B.—One producer of ferroman-anese has abandoned seaboard basing points and has be-un pricing f.o.b. producing plants at Niagara Falls, N. Y., lloy, W. Va. and Welland, Ont. and f.o.b. warehouse, ffective July 1. Fifteen per cent ferrosilicon used for heavy nedia separation is now sold f.o.b. Niagara Falls only. This producer believes this move is essential to protect his osition legally.

DEFENSE ORDERS—First defense orders in Chicago or steel tonnages over what is considered experimental lots vere for army cots. At least 2 separate orders for 140 tons f 1 in. by 20 gage cold rolled electrogalvanized strap stock n coils have been placed. So far the mills have accepted he stock despite the fact that the defense affidavits were ot attached to the orders.

NO POWER—The power situation today is serious, ac-ording to Tomlinson Fort, manager of central sales, West-nghouse Electric Corp. Reserve capacities in the generating ections of this country in 1947 were only 5 pct. At one ime during the depression reserve capacity was 89 pct. To meet 1957 demand will probably require that power ompanies spend in 10 years money equivalent to the total nvestment in all the privately owned utilities in the U. S.

• **NEVER SAY DIE**—The 1069 mile natural gas line from Texas to Michigan and Wisconsin is now being installed. The line was originally designated as 810 miles of 26 in. O.D. pipe and 259 miles of 22 in. O.D. pipe. However, Wisconsin Pipeline Co. could not secure wide enough plates for the 26 in. pipe. Granite City Steel Co. agreed to supply the plates, but their maximum plate width only permitted making 24 in. pipe. Capacity of the line was of prime importance. In order to maintain the same lime capacity, Granite City rolled the plates for the 24 in. pipe to a heavier wall, 5/16 in. Wisconsin Pipeline then boosted their compressor capacity so that the line now consisting of 22 and 24 in. pipe will deliver the same amount of natural gas as the former 22 and 26 in. line.

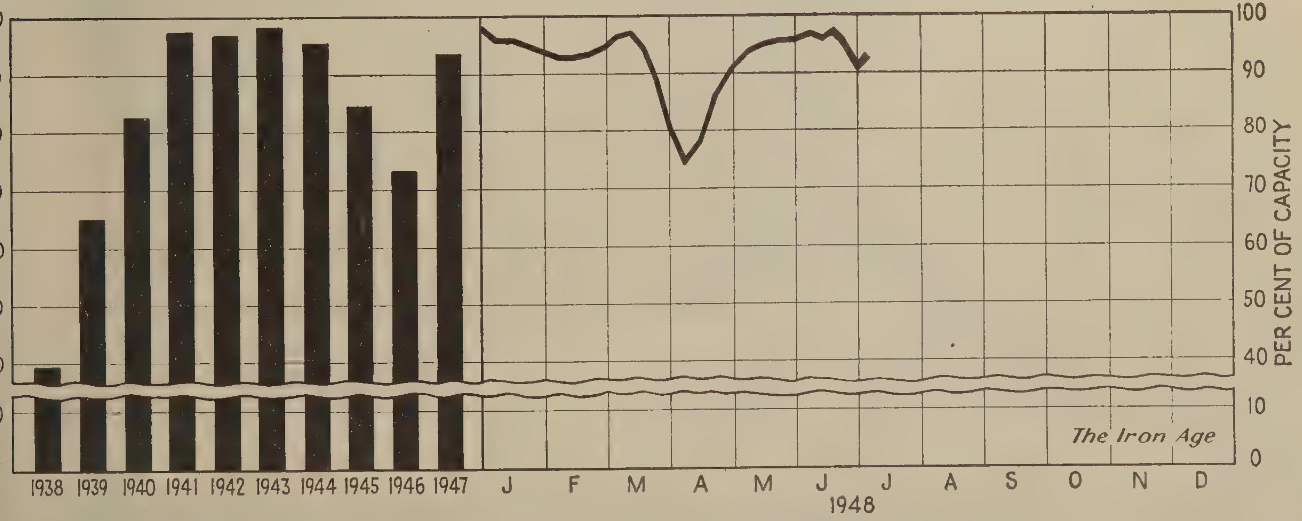
• **BEARING UP**—Effective July 6, Timken Roller Bearing Co. raised prices on all items 5 pct. The base price plus the alloy extra is multiplied by 5 pct to get the new price and excludes freight. So far Timkin is still on a delivered price system.

• **BODY BLOW**—An explosion occurred in the blast furnace blowing engine room at Carnegie-Illinois Steel's South Chicago plant. Damage from the explosion and the subsequent fire put 5 blast furnaces out of action. Estimated loss of ingot production is set at 32,000 net tons. Cause of the explosion has not yet been determined.

• **STILL STRIKING**—The Midvale Co., Philadelphia, is still closed due to a wage dispute. The strike is now in its seventh week. Representatives of the union and the management are meeting from time to time under the auspices of the U. S. Federal Conciliation Service. The 2350 employees are representd by the AFL union.

• **TUT TUT TUT**—Cooking utensils made from stainless steel are undoubtedly excellent—but the Federal Trade Commission doesn't believe that their use adds any life sustaining qualities to the food being cooked. Charges made by the Commission in a complaint made against Cook-Master, Milwaukee, include "luring away the employees of competitors, causing cancellation of competing orders and representing that other methods of cooking destroys minerals and vitamins while the use of stainless steel utensils is conducive to better health."

Steel Ingot Production by Districts and Per Cent of Capacity



	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
...	85.0*	94.0	86.0*	87.0	89.0*	101.0*	95.5	101.0	102.0	97.5	103.0	89.5	91.0	91.0*
...	89.0	87.5	87.5	87.0	98.0	101.0	99.5	102.0	102.0	99.0	106.0	78.0	91.0	92.0**

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8 Outstanding Features

A production of up to 25 parts per minute can be obtained when chamfering and cutting off single parts made from thin wall tubing or pipe. Short length parts can be cut off two or three at a time with corresponding increase in output.

The ends of tubing or pipes can be cropped off easily and quickly.

Both the front and the rear slides take equal chips and thus reduce the cutting-off time to one half.

The volumetric hydraulic pump permits a wide range and selection of feeds. No cams are used.

The collet chuck is operated hydraulically in synchrony with an electrically driven roller stock feed.

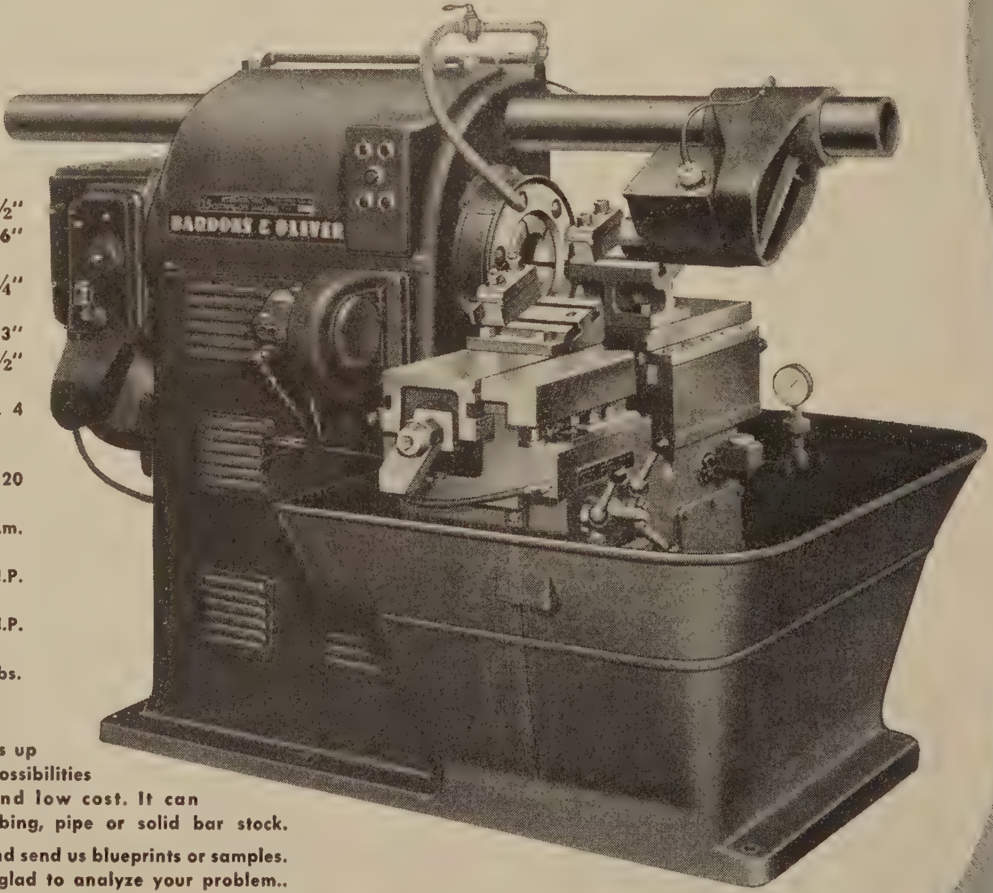
The machine can be operated as full automatic for short or medium long work, as semi automatic for long work or may be manually controlled for cropping tubing and pipes.

Both automatic and hand operated attachments for outside and inside chamfering can be furnished.

The wide spindle speed range has four quick changes for short run work and pick-off gears for close selection of the most efficient cutting speed.

General Data

Capacity	5½"
Hole in plunger and collet	6"
Opening of hinge type collet in diameter	¾"
Maximum length cut off with standard stop bar	43"
Width of tool slides	8½"
Number of quick speed changes	4
Number of speed changes with full set of reversible change gears	20
Full range of speed changes	58 to 660 r.p.m.
Main drive motor, 1800 r.p.m.	10 H.P.
Roller feed motor, 1200 r.p.m.	2 H.P.
Approximate net weight	7500 lbs.



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By JUG HEAD

Roving Editor

In Transit

• • • **Just because a** guy can't buy sheets from the mills is no reason he has to brow beat the help, throw in the sponge, blow down the works or otherwise cease and desist per se. I say this because I recently learned of an outfit, to which sales managers of all sheet companies in the beginning vigorously shake their noggins sideways, and otherwise emphatically refuse to supply sheets, and yet these orphans make plenty of horseless carriages in popular shapes and colors which they peddle both here and abroad at going prices for some time now.

How they accomplish this I find is remarkable indeed, but even more remarkable than somewhat is how they parley this steel procurement system so expertly that the parcel-outers of things flat are now wagging their pimples up and down and even depend on the former outcasts to get them out of snitches such as Taft-Hartleys, mill breakdowns, gas shortages, mental relapses, etc.

This startling revelation comes to me a few days ago at about the time the canned music begins blasting at Rudy's. I am as usual minding someone else's business, which to be exact amounts to flexing the right elbow with Guide Scratch and asking him how's things in steel. This character gets paid by one of the largest seam and blister works in town whose business it is to make bars and sheets of various kinds which they sell from here to ECA and back.

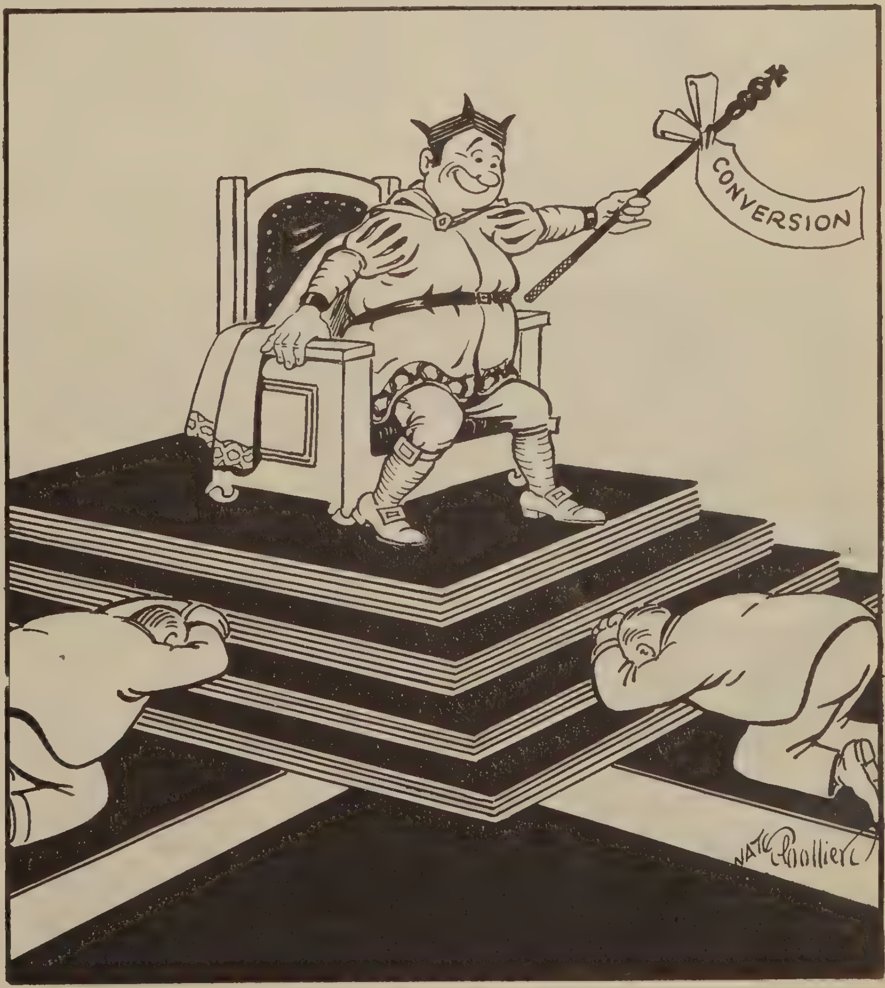
Guide Scratch is a former traveling alchemist for this mill. In days past it is his duty to disagree with steel consumers when they squawk about quality. Guide Scratch is extremely skillful at this trade and gets his title because he so ably convinces so many squawkers over the years that what they call a seam is really just an itsy bitsy scratch and therefore is of no consequence whatsoever and the product is first class in every respect.

He is also a character who can say *no* so nice that I am willing to lay eight to five that the consumers bid him God speed under the impression Guide Scratch actually says yes and that the mill will replace at no charge the 10 lifts of seamy spaghetti they just shipped.

Of course, Guide Scratch never really says yes, and even when he says maybe to the steel consumer he always handicaps the whole deal so that the mill never loses. In fact, so good a handicapper is my friend, that the big wheels of this steel company elevated him to manager of conversion a few moons ago. They think so much of his ability that they promise they will honor his swindle sheet without asking silly questions or even going, "tish, tish, tish." This is a good deal by all means, especially when swindle sheets are tax exempt, and Guide Scratch is hard at work writing copious entries in the swindle sheet.

But to get back to things revealing, Rudy turns on the sales promotion screen, announces a free one to the assorted rumpots present and we are hoisting away when Guide Scratch says I completely miss the best yarn of the decade and he expresses surprise that I and my cohorts suddenly become so dull. He goes on that we in so doing overlook innumerous possibili-

He who has sheets is King



ties of presenting some of the most fantastic deals anyone evolves since the last game the master dealer of all time holds at Tehran.

Having an open mind, I allow as how he might be correct, "but let's elucidate this thing further as very often steel deals defy translation in print no matter how snappy is the copy." Further I say, "How come you are so hep to this operation?" Guide Scratch barks that when the wheels make him manager of conversion it automatically becomes his sole interest so he bones up on everything past and present, and if he doesn't know by now just exactly what goes in conversion, then the 43 in. mill will for sure go down at midnight, the drum works take a holiday starting Friday and the board of directors contract ulcers en masse.

Guide Scratch says he is up to his hip pockets in conversion and this auto company he mentions just finishes giving him a post graduate course, at cost, which will make any AISI's head swim. In fact, Guide Scratch declares these fender boppers know as much about the steel industry as it knows, and if the powers that see are smart they invite this whole gang to Washington post haste.

"Oh, I see," I exclaim, plus, "well, well, well." "Well, hell," yells Guide Scratch, don't I see this makes his team look almost as bad as the Sox up there on the screen, and that's about as malignant as things can possibly get except maybe the plugger of the Missouri Waltz gets back in next November.

Guide Scratch says he just finishes holding a seance with the chief swami of the buggy works, who is now on the way back via one of the planes they use exclusively to keep everyone in touch.

Maybe between us, he adds, we can figure out the deal as Guide Scratch says. So far he thinks he gets too good a break from these traders which causes him to worry lest he actually is on the wrong end of the stick. Now my friend is a very heavy individual in all things steel, so if this confuses him I know for sure the thing must be considerably complex, involving, and completely befuddling to all ordinary characters.

First he says I must appreciate the fact that when this thing starts, sheets, bolts, cotter pins, "hell, everything is tighter than a shrink fit." These adventurers he points out are trying to crack the world's toughest racket. They have no steel, no friends, no history, in fact no organization and the trade generally regards them as strictly a sight draft organization who loses before they start. Guide Scratch says all they have is a will to make horseless carriages, but brother what a will they turn out to have nobody yet appreciates, including their sponsor, a character of no little will and persistence in his own right.

I reply that's well and good but my superior frowns on printing a pure prospectus, brochures or such stuff, so let's get at the meat of what he is raving so much about. The meat, my friend says, is that these magicians dream up an entirely new system of procurement. He squints at the guy sliding into third base up on the screen and says, "New, that is, to us." In the attempt to pin things down I ask, "How old is this system?" Barter, he guesses, is older even than he feels, but essentially that is the system which these traders pull out, dust off, oil up and jet propel in true Buck Rogers fashion.

The funny part, Guide Scratch muses, is that it works even better than Snyder's system as the articles these boys use to barter and trade with keep getting more valuable all the time Snyder's issues keep getting worthless so it would not be surprising if Snyder wises up any day now and gets the mint to give the dies to all pig machine plants so they can coin E Pluribus Unnum, et al, on all pig iron, especially, he adds, they should do this to No. 2 foundry pigs by all means.

Impatiently I try to nail Guide Scratch to give me just one example. OK, Guide Scratch whispers, back in September 1945, the genii start by taking ingots from one coast to the other with a slight layover half way between, where the stuff changes to hot-rolled bands. By the time six different Class I railroads get a crack at it, into the auto plant comes a whole trainload of the prettiest cold-rolled sheets anybody ever lays their gimps on so presto, they are in business.

"Yeah, but a trainload of sheets is a long way from a four door sedan," I counter. Guide Scratch says I overlook one fundamental post bellum truism. "That he who has sheets, has the bull by the only real place to have a bull, all other reports notwithstanding." This fact, proclaims Guide Scratch in fine oratorical style, is what everyone else forgets except our clair-

PIERCING THE IRON CURTAIN: These billets and flats earmarked "North France" are a part of the $6 billion ERP plan. Material such as this may be one of the reasons for Tito's waivering.

voyant friends. Don't I see, he declares, when somebody has sheets he can get anything and that is exactly what these boys proceed to get.

This, I believe, is a slight over statement so I bring up the minor technicality that the things which precede sheets are also very important, as without them no one learns how to make sheets. Ah, Guide Scratch says, now I am seeing the light. The brilliant ones only use sheets to get going. From there on in, they use pig iron, ingots, slabs, sheets, scrap, separately or together, and in all possible combinations. Right now, he adds, the basic medium of exchange is pig iron and how well he knows this I will see a little later.

He tells me that today the auto works has or can make available almost anything, so because of that they are king of the hill. In fact, so much are they king of the hill that right now they are helping at least three dozen old time corporations, all AAAA rating, and if that isn't one for my book he will give it to Ripley. "Here," he says, pounding his chest, "I belong to a large steelworks which is connected with other big manufacturing affiliates. We have been in business for practically the whole machine age, we have an international rep, we have dollars coming out of our ears and look what. When we get into a jam who are the only guys in the world that can get us out?" By now his eyes are moist and I am afraid he is in his cups and maybe this whole yarn is wacky.

I register some consternation as how I can check this tale, and Guide Scratch says he will tell me the whole business so I can check, in fact he wishes I will check as it has him so snafu he cannot tell what is the score. He adds he cannot even tell exactly who is playing. I promise him I will concentrate on the details so between us we may figure out if somewhere there is a herring, the possibility of which Guide Scratch does not wish to encounter if at all possible, or at least without warning.

Gazing intently into his earthen mug, he recalls that back during the first quarter one of the large affiliates which connects directly with his mill suddenly finds themselves fresh out of 20 gage wide sheets. In fact, so far are they out of sheets it looks like the plant will cease operations. This plant gives Guide Scratch emergency powers to secure such sheets. His mill is no help as it does not roll such wide sheets so he thinks he must canvas all sources including infra red, when out of nowhere there appears in his office a scholarly looking fellow who is none other than the chief trader of the auto works he previously mentions.

How this seer knows all about the swelter they are in, Guide Scratch says, he can't figure, but anyway this gentleman recites all the details and then offers to sell Guide Scratch the sheets as the auto works at the moment has an oversupply. The price, Guide Scratch tells me, is at the auto company's cost which is high but not near so high as what he understands various shades of other sheets are. Well, he says, the only thing the autoworks wants in return is a promise that Guide Scratch will return in third and fourth quarters the same tonnage they just offer to sell him. "These sheets are to move at the price in your good book," he tells me. I say this is very fair and Guide Scratch nods yes, and he adds he goes through with the deal.

Editor's Note: This story was written by one of our editors. It is about 90 pct fact and the rest fiction and light handling. We run it without the editor's name or the names of his contacts. It tells in an amusing manner the troubles a large consumer experienced in trying to obtain steel. This new twentieth century form of procurement is told here—for the first time. Be sure and try the pretzel game—it works!

I ask him where is he going to get the sheets to pay them back later in the year and Guide Scratch says they plan to earmark part of their quota from a certain mill to take care of this, as by that time they think they will be in much better shape sheetwise. I say this is not so complex. He says I should stop looking around the room as so far he just outlines the beginning of what turns out fantastic in all senses of the word.

He tells Rudy to repeat our previous order and continues, "The auto company ships the sheets which are first class in all respects." The fabricating shop starts up again and everything is lovely until a certain character raises his eyebrows and flooey, all the miners take a breather which causes steel companies all over the map to slow down to a walk.

"What's this got to do with the sheet trade?" I demand. Guide Scratch replies the week the double whammy takes place his source of sheets, which is to pay back the auto company, starts wiring NDP memos all over in wholesale lots, most of which Guide Scratch says land on his desk, and it is plain to see that if this works goes down Guide Scratch will have to welch on his promise to pay back the guys who so kindly get him out of a hotbox.

"Now," Guide Scratch croaks, "You know I am not a welcher." This I know to be true and I also know this is painful indeed to my friend and he worries no end about what certain citizens will think when they hear he welches, particularly the bookies out at the Park who over the years respect and honor him so much they will at any time make large markers in their books on the various nags Guide Scratch wishes to back—regardless of odds, weather or insobriety.

Well, Guide Scratch is just about to the end of his hemp on this, he says, and is even in the act of grabbing the long distance pipe to make his welch when who strolls into his office again but the calm omnipotent swapper from the buggy plant. This time the trader again outlines the difficulties which beset Guide Scratch and sympathizes with him no end, and then casually adds he knows how to circumvent the welch Guide Scratch thinks he has to make.

Now, says Guide Scratch, get this. "The learned one tells me that one of our affiliates has a very neat pile of coking coal down the river. This bituminous," the trader says, "can be the key to all my troubles if I will just play along."

Guide Scratch tells him that so far things bituminous are certainly the key which causes him his troubles, but if the swami can reverse the reaction he is willing to listen, in fact he will pull all the phones out by the roots and harken indefinitely. The trader tells my friend that all that is necessary is for him to sell the buggy works 20,000 tons of this coal, providing Guide Scratch can get his wide sheet source to agree to do certain other things.

By this time I am hanging on every word and even forget to notice the two cheesecakes who seat themselves quite close to us, one of which the next day is exceedingly put out because I overlook her presence entirely. Guide Scratch tells me the auto plant wants to ship the coal to a certain point where two important rivers make a triangle. Guide Scratch must then get his sheet source to agree to take 3000 tons of pig iron a month from a blast furnace which is on slack wind and is yelling at the medium to get them coke before the stack gets cold as the eyebrows are still in a raised position.

In return for the pig iron this sheet mill should then ship Guide Scratch 1500 tons of sheets, half of which he should in turn earmark to the trader. This will allow the fabricating shop to keep going. It will keep the sheet works from going down, in addition it will allow the mesmerizer's blast furnace to keep running as without the coal Guide Scratch sells him to make coke to make iron to make sheets the swami himself is not long for this world, my pal tells me.

By now I don't know whether to complain to Rudy that he knows I don't partake of the stuff out of the high octane spigot or whether I should direct my complaint to Guide Scratch, for the walls of the gin mill are revolving past me at a most disconcerting pace. I take a firm hold on the table and Guide Scratch continues that the trader outlines by shipping an extra 8000 tons of pig iron to the sheet works a little later they should be willing, Guide Scratch asks them, to ship 4000 tons of sheets direct to the auto works in third and fourth quarter, which will take care of the I.O.U. Guide Scratch makes in the first place and this, therefore, makes it unnecessary for my friend to commit the welch he worries so much about.

At this point I am feeling no pain, the plan seems crystal clear and wonderful indeed so I slap Guide Scratch on the back and shout, "Hooray!" He frowns and says, "You cheer prematurely." "What have you got to lose?" I counter. I point to the clincher about not having to welch and say to him as follows, "this fact alone makes it worth while." It seems, however, strange that the auto company first sells sheets and then goes to no end of trouble to get the same kind of sheets back so this I point out to Guide Scratch is a possible sleeper.

Industrial Briefs . . .

- **LICENSEE ADDED**—Greer Steel Co., Dover, Ohio, is the eighth steel company to be licensed by Carnegie-Illinois Steel Corp. to produce Cor-Ten. Carnegie officials see extension of sales of this high-strength low-alloy steel in the lighter sheet and strip gages which are a specialty with Greer.

- **CANADIAN OUTLET**—Modern Tool Works, Ltd., 69 Montcalm Ave., Toronto, has recently been named Canadian distributor for Defiance Machine Works, Inc., Defiance, Ohio, manufacturers of preform presses and the new Tri-Dyne moulding press.

- **APPOINTS DIRECTOR**—Charles O. Burgess, for 25 years head of the Steel & Gray Iron Research Laboratories of Union Carbide & Carbon Co., Niagara Falls, has been appointed technical director, Gray Iron Founders' Society, Inc., Cleveland, where he will establish a technical department of the society.

- **CHANGE OF ADDRESS**—The Steel Joist Institute has recently moved to Dupont Circle Bldg., 1346 Connecticut Ave., N. W., Washington 6.

- **LETS CONTRACT**—The Meehanite Metal Corp., New Rochelle, N. Y., has announced the closing of two contracts for the manufacture of Meehanite castings with Pesce & Simeone, S.A. of Montevideo, Uruguay, and Metallurgica Wallig, S.A. of Porto Alegro, Brazil. Both companies will utilize Meehanite castings in various products which they manufacture.

- **PLANT FOR SALE**—The War Assets Administration announced that it is taking bids on the steel forging plant at Cicero, Ill., which was operated by the Kropp Forge Co. in wartime. The sale is subject to the security clause. Bids were received in Washington until 3 p.m. July 2.

- **REPRESENTATIVE** — The Eynon-Dakin Co., Detroit, has been appointed by Arens Controls, Inc., Chicago, as its exclusive representative of flexible and rigid remote control equipment for the state of Michigan.

- **ACQUIRES PROPERTY**—Standard Oil Co has announced that it has purchased approximately 960 acres comprising the former Jones & Laughlin Steel Corp property in Hammond, Ind. Standard has acquired the property for future expansion but no specific plans have yet been developed for its ultimate use.

- **NEW SALES FIRM**—A new sales organization, Chemical Pump & Equipment Corp., with offices at 75 West St., New York, has been formed to represent manufacturers specializing in chemical processing equipment. Officers are Robert T. Sheen, president, and John W. Welker, vice-president.

- **BUYS MACHINE PLANT**—Gene Siferd, formerly tool engineer for Lima Div., Westinghouse Electric Corp., has purchased the fixed assets of the J. W. Tool & Machine Co., Lima, Ohio, and has changed the name to J. W. Tool & Machine Industries, Inc. The firm will continue steel plate fabrication and contract machining with additional departments being formed in tool designing and consulting engineering.

- **CHANGES NAME**—American Foundrymen's Assn. has voted to change its name to American Foundrymen's Society. The change was adopted by the membership in a general revision of bylaws which became effective July 1.

- **MOVES OFFICES**—General Steel Castings Corp. has moved its general offices to Granite City, Ill. The headquarters of the treasury and purchasing departments will continue at Eddystone, Pa.

He grunts, "It's no sleeper." He says at the time they want to sell the high price sheets they find it wise to liquidate all high cost inventories. Through this mutual aid pact they get rid of the high price sheets at their cost and merely get the same kind of sheets back at much lower cost, which is very understandable and also is a most skillful maneuver indeed.

He continues, "On the surface this deal looks fine but the auto company grants me entirely too many unheard of favors." He is fearful that somewhere, somehow, they must be getting something more than just mill price sheets, and maybe that something is from him and he as yet doesn't know what it is and that's what's bothering him. He tells me he checks with others, and they all tell him the auto company is very up and up and always keep their promises. In short, he finds they have a most enviable reputation, "but just the same this deal sounds too good."

The coal, I recall, the swapper himself says is the key so that must be what they are getting. "Yeah," Guide Scratch says, "but they pay for the coal, they pay going prices for all the sheets and certainly this is not adequate remuneration for all the trouble they go to."

Rudy is now counting the night's take at the till, the sweep-up is piling chairs all over and about, and Guide Scratch and me, plus one of the hired help, are all that is left in the whole gin mill. Guide scratch solemnly proclaims he wishes he can see through this thing before morning as if not insomnia is sure to set in. Being resourceful and in a rather high key I say, "Well, let's act this out play by play and maybe it will become more clear." Guide Scratch says it could not get less clear, so I call over Rudy, the sweep-up and the pancake who deals them off the arm on the evening shift.

I outline our problem and request their cooperation, in this play we are about to produce. Guide Scratch has to underwrite the pancake's effort at double time, as she says her contract with Rudy for the day expired 15 minutes ago. On the next table is a basket of pretzel sticks so I quickly grab them and say to Guide Scratch, "Here is 20 pretzels each representing 1000 net tons." He piles them up in front of him.

I say, "I am the auto company. Rudy is the blast furnace, who I own as I am the auto company, and the sweep-up can be the independent sheet works and that completes the main characters in the cast except for the coke works." I assign the pancake to be the coke works to which she takes personal affront until Guide Scratch explains that this kind of coke is not the same as that which causes various characters to get hopped up.

To start with, I give Guide Scratch four pretzels and he writes out an I.O.U. for 4000 tons of 20 gage sheets, which I put in front of me at my table. He now has 24 pretzels but he gives me back 20 which I promptly deposit in front of the pancake as she is now the coke works. This means she has 20,000 net tons of coal. We tell her that according to standard practice when she changes coal into coke she only has 15,000 tons left so she should eat five pretzels and give Rudy 15 as he is the blast furnace. Guide Scratch says we should now change net to gross so we then tell Rudy to also eat two pretzels, leaving him but 13 plus or minus a few crumbs.

Steel Wages and Prices

New York

● ● ● For outlook on steel wages, prices and f.o.b. mill practices see p. 116 in this issue. For analysis of f.o.b. mill selling see p. 125.—Ed.

Now I order Rudy to take three pretzels from his table to where the sweep-up sits, which is the same as 3000 tons of pig iron. This he reluctantly does, and the sweep-up drops one and it breaks squarely in half. We are about to replace it when Guide Scratch says no, that is OK and the sweep-up should give us half of what he gets, or 1500 tons of sheets. Guide Scratch picks up the broken pretzel, I get ¾ of a pretzel and he gets the same only in very little pieces.

Rudy who often has to play games with other customers as a matter of policy, tells us this is the most interesting game by far he ever engages in. We sit there looking at the pretzels, each of us, on his table and discover that the sweep-up has 1½ pretzels left and Guide Scratch loudly yells, "Why those so and so's" I caution him that one ton of pig iron does not yield one ton of sheets, as in the processes there are innumerous losses.

Guide Scratch shouts let's go through with the second part wherein another 8000 tons of the now legal tender goes to the sheet works, who so far makes out surprisingly well, particularly when they get iron in gross tons and ship sheets in net tons. Rudy takes another eight pretzels to the sweep-up's table who in turn gives me four. I now have 4¾ pretzels so I give Guide Scratch his I.O.U. back, as we figure this completes the first deal. The sweep-up, who is representing the sheet works, has 5½ pretzels. The pancake has none, but this is as it should be.

Guide Scratch is mumbling about the sweep-up having too many pretzels, "losses or no losses," and at least we learn something from our play but all is not well yet. looking at Rudy, Guide Scratch says, "Hell, we miscount, things are not even, Rudy still has two pretzels." Guide Scratch says maybe he should give the psychiatrist the company just hires as his assistant a ring to come down here to finger this out. Rudy offers us the use of the abacus he keeps in the back room which he uses when he fills out the forms about his revenue, or better yet why don't we send the pancake home to get her Ouija board.

Heads in our hands we are looking from one table to another counting pretzels and studying intently, all the time the pancake is tapping her foot and watching her timepiece and reminding Guide Scratch she is on double time and she has witnesses to prove it. We check back and forth and Guide Scratch says the only thing this brainstorm of mine produces which he before forgets to realize is that the sheet works get entirely too many pretzels and this explains why those so and so's are so willing to go through with the deal when he propositioned them a few months ago.

He goes on to shout that first thing on the morrow he is going after one half of the X tons of sheets they net in the process, as "without the coal I sell the auto company they would not make any pretzels at all." I also point out that in return for the four pretzels I originally give him I so far get

(CONTINUED ON PAGE 128)

Construction For '48 Bids Fair To Reach Government Forecast

Washington

• • • **Total new** construction for the first half 1948 approximated $7.7 billion, according to preliminary estimates by the Commerce Dept. Should this rate continue, 1948 building activity bids fair to reach or exceed forecasts by the government at the beginning of the year.

Industrial construction continues to decrease, the lone category to do so. A slight increase is noted in public construction which amounted to $387 million for June, bringing the six-month total to $1.6 billion.

Total construction put in place during June was estimated at $1.6 billion, a new peak and 38 pct greater than the volume for the same period in 1947. Privately financed construction accounted for $1.2 billion of the June total.

Effect of the expanded national defense program is slow in reaching the construction industry. The six-month total for military building stands at $78 billion for the year, a slight decrease over 1947.

On the other hand, highway construction is jumping, reaching $170 million in June from $135 million during the previous month.

Stores, offices, warehouses and other commercial buildings continue to show a rising dollar volume. Totals for the first half 1948 stood at an estimated $560 million, a rise of $200 million over the same period 1947.

Metallurgist Retires Has 30 Years Service

Bethlehem

• • • **Henry Wysor,** metallurgical engineer on the staff of the operating vice president, retired from active service on July 1 according to an announcement by the Bethlehem Steel Co.

Henry Wysor

Mr. Wysor is a graduate of Virginia Polytechnic Institute. Prior to coming with Bethlehem, he taught at Lafayette College for 14 years. He served the last 6 years as head of the department of metallurgy.

In 1918 Mr. Wysor joined Bethlehem and served the company in various metallurgical capacities for 30 years.

Coming Events

July 16-24 American Road Builders' Assn., convention and Road Show, Soldier Field, Chicago.

July 26-27 Institute of Scrap Iron & Steel, midyear meeting, Atlantic City.

Aug. 30-Sept. 3 American Chemical Society, national meeting, Washington.

Sept. 6-10 American Chemical Society, national meeting, St. Louis.

Sept. 13-17 American Chemical Society, national meeting, Portland, Ore.

Sept. 13-17 Instrument Society of America, conference and exhibit, Philadelphia.

Sept. 28-Oct. 1 Assn. of Iron & Steel Engineers, Convention and Iron and Steel Exposition, Cleveland.

Oct. 5-7 Industrial Packaging Engineers Assn., Industrial Packaging and Materials Handling Exposition, Chicago.

Oct. 5-9 Concrete Reinforcing Steel Institute, semiannual meeting, Asheville, N. C.

Oct. 11-13 National Lubricating Grease Institute, annual convention, Chicago.

Oct. 13-15 Porcelain Enamel Institute, annual forum, Urbana, Ill.

Captive Mines Contend Union Shop Provision Is Unfair Labor Practice

Washington

• • • **The several steel** companies operating coal mines of their own have filed with the General Counsel of the National Labor Relations Board charges of unfair practices against the United Mine Workers of America. Charges are on grounds that the unqualified Union shop provision included in the new labor contracts applicable to the captive coal mine operators is in violation of the Taft-Hartley Act.

"The Act expressly provides that it shall be an unfair labor practice for an employer to make a Union shop provision effective unless the National Labor Relations Board has certified that at least a majority of the employees have voted by secret ballot under NLRB supercision," said Henry M. Moses, president of H. C. Frick Coke Co., spokesman for the captive coal mine operators.

Captive coal mine operators repeated their willingness to accept the new labor contract recently negotiated between the commercial bituminous operators and the United Mine Workers of America provided the Union shop provision contained therein is qualified, so as to provide that it does not become effective until authorized by their employees in the manner specified in the Taft-Hartley Act.

Moses contends that the mine operators are unwilling to deliberately commit an illegal act such as accepting the contract in the form now demanded by the Union.

"Solution of the matter is of great importance to the nation," he added. The existing coal stocks of these steel companies are limited. A reduction in steel production at this time when steel is so much in demand would strike a serious blow at general industrial activity which is essential to the national interests, both at home and abroad.

Army Orders Jeep Engines

Detroit

• • • **U. S. Army** has ordered 17,600 military jeep engines for replacement and stockpile purposes from Willys-Overland Motors, according to a recent announcement by Arthur J. Wieland, executive vice-president.

Switch to F.O.B. Mill Steel Sales Brings Up Complex Questions

"How to Compete?" Unsolved As Steel Men Hammer Out Details of System

○ ○ ○

By GEORGE F. SULLIVAN
Pittsburgh Editor

○ ○ ○

Pittsburgh

• • • **The switch to** f.o.b. mill selling has uncovered a lot of complex problems which steel companies haven't yet ironed out. It was known that the change, predicted a month ago (THE IRON AGE, June 17, pp. 116 and 117), would unleash a pandora's box of major complications for the industry and its customers. Some were obvious, others are just showing up.

As steel executives got down to hammering out details some hurdles loomed. Most companies planned to change soon after Big Steel moved but price advances were troubling them too. They sneaked around f.o.b. hurdle No. 1 labeled "How do you sell steel when your price is higher than the other fellow's?" That's no problem today.

The other hurdles were right at hand. They included the problem of increased demand for truck shipments; of moving more steel by barge; of where to enter the order where the company has two or more mills making the same product; of transferring orders in event of mill breakdown; of customers switching supply sources and mills withdrawing from markets.

How far to go on individually negotiated sales of tinplate and stainless was another sticker, and what about the intensely competitive cold-finished bar market? To what extent will costs rise because some raw materials were shifting to an f.o.b. mill basis? A wider price spread in finished steel loomed too.

Taking them in the aggregate it seemes the changes won't be rough on steel people—now. The future looked like raw corn—but they avoided a potential hangover by merely sniffing at that bottle.

More customers are going to want more steel shipped by more trucks. Except in new or recently renovated plants loading a lot of trucks is a problem. Truck loading facilities will be increased—in several companies improvements are already in the planning stage. Mills will do their best to meet requests for truck loading, but if demand comes up to what traffic men anticipate they'll be unable to meet them all.

Looking ahead, Carnegie-Illinois recently made a trial shipment of several different customers' orders to Cincinnati by barge. Warehousing arrangements were made there to handle its distribution. Chicago mills have long been planning to step up barge shipments (THE IRON AGE, May 20, p. 119). Pittsburgh mills have their eyes on cutting costs by barge shipments to Cincinnati, Louisville, Evansville, Ind., Cairo, Ill., and Nashville, Knoxville and Chattanooga, Tenn.

The Cleveland customer dealing with a company that has mills in Cleveland and Pittsburgh will want his order entered at Cleveland. But Pittsburgh produces more steel than it consumes. He may be told that Cleveland is booked up—that if he wants reasonable delivery time he'll have to let his order be scheduled at Pittsburgh and pay the extra freight.

That same customer might also have some tonnage booked at Cleveland. Supposing a mill breakdown halts his order? Can the steel com-

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Ben Fairless Says Too Bad, But —

Pittsburgh

• • • Benjamin F. Fairless, president, U. S. Steel Corp. says: "In the near future, the steel-producing subsidiaries of U. S. Steel Corp. will adopt the method of announcing prices for steel products at the mill or shipping point, or, if the customer so desires, at delivered prices which reflect full transportation charges from shipping point to destination.

"The abandonment by these subsidiaries of the basing point method of selling steel—a merchandizing practice not resulting from collusion, but one which has developed naturally by evolution in the steel industry over the past 50 years to the mutual advantage of both steel producers and consumers—is made necessary by the recent decision of the Supreme Court of the United States in the proceeding brought by the Federal Trade Commission against members of the cement industry. In that case, the Supreme Court held that the basing point delivered price system employed in the cement industry (which is generally similar to that now in use in the steel industry) is an unfair trade practice which the Federal Trade Commission may suppress.

"We have no recourse other than to comply with the law of the land as determined by the Supreme Court, regardless of the hardships and dislocations to American industry which may result.

"In the past, these subsidiaries have competed for steel business in geographical areas where competitors nearer to the buyer have freight advantages. In order to compete, our subsidiaries normally have quoted delivered prices low enough to equal the delivered prices of the competitor located nearest to the prospective customer. In our judgment, we were fully justified in meeting in good faith the price of a more favorably located competitor. Competition was stimulated and not hindered by such a practice. Naturally, meeting competition in this way has resulted in differences in the net proceeds of the producing steel mill on sales of the same product to different customers located at different places. This is evidence of competition, not of its absence.

"But the Supreme Court has now ruled that the right to meet an equally low price of a competitor does not permit 'a seller to use a sales system which constantly results in his getting more money for like goods from some customers than he does from others.' The Supreme Court attached importance to 'individual competitive situations,' suggesting that there might be exceptions in particular individual cases. However, it is unrealistic to suppose that these subsidiaries can market satisfactorily more than 50,000 tons of finished steel each day throughout the year without the use of a standard merchandizing method, fully understood by both buyer and seller.

"The management of U. S. Steel believes that the systematic meeting of delivered prices of competitors is essential to the maintenance of competitive industry in this country and is of great benefit to many businesses, both large and small, throughout the United States. This practice of meeting competition through the absorption of freight is wide followed in American industry. Despite our serious doubts about the advisability and economic soundness of this radical change in our subsidiaries' marketing methods, we feel that they have no alternative other than to comply with the decision of the Supreme Court of the United States."

pany ship from Pittsburgh? Heretofore they have done so for good customers caught in this spot—at the Cleveland price. Now the transfer of the order can be made only with the customer's permission and the law apparently requires him to pay the freight the mill formerly paid.

Some switching of supply sources is in the cards. The Youngstown fabricator who now buys from Pittsburgh and the Pittsburgh fabricator who buys from a Youngstown mill may decide to switch to sources of supply in their own backyards. This means some upsets in customer-mill relationships. Perhaps more intensive selling—more work on the part of the salesman—will be evident.

A lot—but by no means all—tinplate is contracted for on an annual basis. Delivered prices in these contracts may no longer hold up under the Supreme Court decision. And to break a company rule and meet competition by individual negotiation on tinplate might open the floodgates for protests from large users of other steel products. Smaller tinplate producers might not be so encumbered.

The same applies to stainless steels though there are indications some stainless producers—who have long had basing points at most of their mills—may negotiate individually with some customers to meet competition. Legal opinion is that such individual negotiations are lawful even though big producers can't operate efficiently by individual dickering on each and every order.

The full impact of a switch to f.o.b. mill sales by some suppliers of equipment and raw materials has yet to be felt by steel producers though refractories went f.o.b. last week. For nonintegrated steel mills that impact is obvious. Generally speaking they face higher costs on their principal raw material—semifinished stel. The price umbrella big producers had long held over nonintegrated mills started leaking this spring. Now f.o.b. mill sales are hacking it to ribbons.

Steel spokesmen long ago prophesied that the end of the multiple basing point system would mean a growth of monopoly in the industry. Admittedly, when competition gets stiff the steel company with the most plants will be best equipped to meet it. But even now some steel men foresee an increase in the independence of action of mills located at some distance from competition.

It is possible for mills several hundred miles removed from their nearest competitor to have f.o.b. mill prices that are higher than they would be under a more competitive system. The Supreme Court may not have so intended it but well informed observers see it as a distinct possibility. The customer who would have to pay $8 or so more per ton to tap another source of supply couldn't successfully protest paying $3 or so more to his neighboring mill.

That the American Iron & Steel Institute's freight rate compilation was tossed out the window is considered minor. It just adds a little to the customer's confusion. Most steel users today haven't the slightest idea what steel will cost them f.o.b. mill. That, coupled with price changes, will find them a little further confused. But the customer can get any freight rate he needs by calling any steel sales office. The steel salesman can still quote a freight rate without risking a suit for triple damages.

* * *

Wheeling, W. Va.

• • • **Wheeling Steel Corp.** declared on July 8th that it would probably switch to an f.o.b. mill or some similar method of pricing steel within a few days. The company said that it had been seriously considering the impact of recent court decisions on the basing point method, adding that it believed the f.o.b. mill method would inevitably restrict competition. "However," a company spokesman declared, "it would appear that we do not have a free choice in the matter."

50 YEARS AGO

THE IRON AGE, *July 14, 1898*

• "The mercantile need of the hour in the export business calls for competent, well-bred, well read men (not necessarily book lore, but living issues) possessing intimate knowledge of a given class of manufactured goods and speaking foreign languages, to go abroad and sell American goods. Not ten salesmen out of one hundred prove successful."

• "The Avery molding machine manufactured by the Whiting Foundry Equipment Co. of Harvey, Ill., marks a wide departure from previous designs. Its main characteristics are marked by the saving in labor and floor room occupied by the molds, and by the rapid and effective manner in which it performs the work."

• "San Francisco, July 4, 1898—It is reported the movement to secure to San Francisco that share of the government patronage to which she is justly entitled bids fair to result in complete success."

• "The advantage enjoyed by Indiana of cheap natural gas as fuel for manufacturing is not likely to remain long, the state geologist says. The residents not only waste the oil in their furnaces, grates and stoves, but they have been allowing 20 million or more cu ft of gas to escape daily through neglect of capping the wells which have been bored for oil. These and other signs indicate the end of the natural gas supply is rapidly approaching."

• "Experience with aluminum conductors recently installed by the Niagara Falls Hydraulic Power & Light Mfg. Co. seem to indicate that, while aluminum cables require more insulation than copper, it is likely that there is a field for the use of aluminum in feeder cables."

• "Three new different styles of riveters are being built by the Watson-Stillman Co., 204 E. 43rd Street, New York. There is a 20 ton and 35 ton portable riveter and a 150 ton fixed riveter included in this new line."

Steel, Foundry, Scrap Industries' Committee Chairman in Germany

Wolcott's Mission To Eliminate Obstacles Hindering German Scrap Shipments to U. S.

By WILLIAM V. PACKARD
Ass't News, Markets Editor

New York

• • • **The steel,** foundry and scrap industries are tightening their belts in anticipation of a lean winter—at least as far as scrap supplies are concerned. This grim fact stood out in bold relief at a meeting of the joint Steel, Foundry and Scrap Industries' Committee for Expediting Iron and Steel Scrap held here last week.

Ostensibly the meeting of the committee was to announce the departure of its chairman, Robert W. Wolcott, to Germany, at the request of Secretary of Commerce Charles Sawyer. Mr. Wolcott's mission is "to see what can be done to eliminate the remaining obstacles which stand in the way of the shipment of scrap from Germany to the United States." But the news of his departure was somewhat overshadowed by the gloomy views held by the industries which he represents.

Extreme concern over next winter's scrap supply is based on (1) current low inventories, (2) record-breaking rate of consumption and (3) dissipation of former reserves.

At the meeting Carl A. Ilgenfritz, vice-president of United States Steel Corp. and vice chairman of the industry's scrap committee, declared that scrap inventories have been staying at about 600,000 tons below those of last September. He added that even the inventories of last September had been considered inadequate.

In the face of these low scrap reservoirs, according to Mr. Wolcott, consumption of purchased scrap in March was 2,665,000 gross tons. This represents an annual rate of 32 million tons, which would set an all-time high.

The industries agreed that two important sources of scrap which helped greatly in relieving the shortage of the metal last winter could not be depended upon in the lean times ahead. One of these sources was government scrap, including the Army, Navy and WAA. These sources, it was said, have been largely exhausted, and cannot be expected to alleviate the anticipated famine.

It was also pointed out that various scrap drives during and after the war had already largely dissipated possibilities in this direction. The answer, according to the committee, is to get scrap from foreign sources, chiefly Germany.

There can be no doubt that the industry's fears over future scrap supplies are real. The steel industry, especially, feels that it is on the spot. It knows that if anything happens to disrupt steel production its critics will not be appeased by an explanation that shortage of scrap hamstrung production.

Various other missions and committees have established well-trodden paths to the precious piles in Germany—and elsewhere. Yet the results have been meager. The joint committee knows this. The fact that it represents the three industries most vitally concerned is at least a step in the right direction. It remains to be seen what success it will have in convincing General Clay and the State Department that the situation is sufficiently critical to warrant changes in policy which might assure them of success.

In this pursuit they will have the backing of the Commerce Dept., which, it will be remembered, sponsored the previous Industry-Government Scrap Iron and Steel Mission to Germany. It was this mission that created a furor by asserting that there were 10 million tons of scrap in Germany. Since that announcement some people apparently have believed that nearly all of this amount could and would, eventually, be shipped to the United States.

The present committee has no such grandiose ideas. It hopes to be able to pry loose 2 to 3 million tons. According to Mr. Wolcott, this would aid in meeting our domestic requirements of 28 to 32 million tons annually.

In sizing up the worldwide picture on scrap, Mr. Ilgenfritz admitted that Bethlehem's ambitious program in China and the South Pacific had fallen far short of original expectations. He declared that "we are very dilligently working" on the 3½ million tons of scrap reported to be in Japan. However, no figures were mentioned on tonnages which might be made available to this country.

Mr. Ilgenfritz declared that he was a "little more optimistic" than previously over prospects for foreign tonnages. To substantiate his optimism, he cited that General Clay had recently authorized export of 240,000 tons of German scrap, including 40,000 tons already reported as purchased.

He declared that the industry does not care how the scrap is brought back—just so they get it. Although he said he believed the regular channels of scrap dealers could do the job best, the steel industry would not be opposed to the idea of a joint effort on the part of scrap consumers.

Present price for German scrap is $26 fas, which amounts to $38 at Atlantic Seaboard ports. It was brought out that Britain has had better success than the U. S. in obtaining German scrap because she (1) started first, (2) paid in pounds instead of Reichmarks and (3) offered incentives of food and clothing. American scrap dealers have been willing to match the British offers, it was pointed out, but have encountered opposition on the grounds that other businesses would envy preferential treatment for the scrap industry.

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

600 **Tons,** Chicago, building for the U.S. Rubber Co., through A. Epstein Sons Inc., to Jos. T. Ryerson & Son, Inc., Chicago.

300 **Tons,** Menasha, Wis., power plant to Milwaukee Bridge Co., Milwaukee.

290 **Tons,** Grand Forks, N. D. steam power plant through Ellerbe Co., Minneapolis, to Des Moines Steel Co., Des Moines, Iowa.

250 **Tons,** Norristown, Pa., senile building for Norristown State Hospital, to American Bridge Co., Pittsburgh.

220 **Tons,** Cook Co., Ill., bridge section 0707-GF State Highway Dept. to Bethlehem Steel Co., Inc., Bethlehem.

200 **Tons,** Cook Co., Ill., state highway bridge section 0606-2HF State Highway Dept. to Bethlehem Steel Co., Inc., Bethlehem.

200 **Tons,** Chicago, building for Rodeis Lumber and Veneer Co., to Jos. T. Ryerson & Son, Inc., Chicago.

160 **Tons,** Chicago, warehouse for Illinois Bell Telephone Co. to Duffin Iron Co.

140 **Tons,** Harrisburg, Pa., Market St. bridge floor beams, to Bethlehem Steel Co., Bethlehem.

130 **Tons,** De Witt Co., Wis., bridge section F04-4-15 State Highway Dept. to American Bridge Co., Pittsburgh.

• • • **Fabricated steel inquiries** this week included the following:

1500 **Tons,** Philadelphia, Vine St. bridge for Reading R.R., Golder Construction Co., Philadelphia, low bidder.

375 **Tons,** Skokie, Ill., building for the General Steel Warehouse Co.

235 **Tons,** Astoria, Ore., steel sheet pile breakwater in Columbia River, Portland District, Corps of Engineers, Serial No. Eng-35-026-48-924, bids to July 21.

150 **Tons,** Chicago, alterations to the freight terminal Chicago Union Station Co. Bids closed June 30.

• • • **Reinforcing bar awards** this week included the following:

3500 **Tons,** Chicago, Chatham Park apartment building annex to Trucson Steel Co., Cleveland.

360 **Tons,** Chicago, warehouse and office building for Horders, Inc. to Coth & Goss, contractors.

570 **Tons,** Evanston, Ill., store for Wieboldt to Jos. T. Ryerson & Son, Inc., Chicago.

• • • **Reinforcing bar inquiries** this week included the following:

1300 **Tons,** Springfield, Ill., colesum for the State of Illinois.

1000 **Tons,** Havana, Ill., 63 ammunition magazines for the U.S. Army Ordnance Depot.

225 **Tons,** Tulare Co., Calif., bridges and construction between Tipton and Tulare Airport, California Div. of Highway, Sacramento, bids to July 28.

100 **Tons,** Chicago, laboratory for Glidden Co. bids closed May 1, project postponed on account of high cost.

• • • **Piling inquiries** this week included the following:.

4765 **Tons,** Astoria, Ore., steel sheet pile breakwater in Columbia River, Portland District, Corps of Engineers, Serial No. Eng-35-026-48-924, bids to July 21.

• • • **Railroad car awards and inquiries** this week included the following:

The Northwestern R.R. has ordered 19 70-ton covered hopper cars from General American Transportation Co., Chicago. The Rock Island R.R. will buy 10 Diesel locomotives from Electro Motive Div., of GMC for suburban service. C & E. I. R.R. has ordered the following locomotives from Electro Motive Div. of GMC.: 10 type A 1500-hp freight engines; 5 type B 1500-hp freight engines; 2 type BL 1500-hp branch line freight engines; 2 1000-hp switchers, and 2 1500-hp passenger engines. American Car & Foundry Co. has been awarded 100 70-ton gondolas from the Monongehela connecting R.R. Co. The Greenville Steel Car Co. has been awarded 50 50-ton box cars, 152 ft long from Western Maryland R.R. Louisville & Arkansas R.R. has ordered 100 70-ton hopper cars from General American Transportation Co. The Santa Fe R.R.'s entire car building program for the year 1949 is as follows: It will build 250 40-ton refrigerator cars and 50 70-ton gondolas in their own shops, at Topeka, Kan. 750 50-ton box cars are to be placed elsewhere in the fourth quarter of this year for 1949 delivery.

Record Truck Registry

Detroit

• • • **Truck registrations** for April set an all-time high when approximately 108,000 units were registered in the United States. This is more than 20,000 units above the industry's previous high mark set in October 1947, according to R. L. Polk & Co., statisticians for the automobile industry.

New passenger car registrations for April are expected to be the highest for any month since resumption of car production at the end of the war. Returns from 46 states totaled 288,298 units.

Masters Degrees Awarded

Detroit

• • • **Masters Degrees** in Automotive Engineering were awarded to 21 students of the Graduate School of the Chrysler Institute of Engineering at the institute's fifteenth annual graduation exercises in the Rackham Memorial Bldg., Detroit, on June 30.

In addition, 33 students of the Undergraduate School received certificates in Body Drafting and Design, Mechanical Drafting, Science, and Chemical Technology; and two others were awarded diplomas indicating completion of their high school work.

Howard A. Coffin, former general manager of the Socony Vacuum Oil Co., Detroit, and Congressman from the 13th Michigan District, delivered the commencement address.

J. C. Zeder, president of the Chrysler Institute of Engineering and chairman of the Engineering Board of Chrysler Corp. presided.

Deals, Inc.

(CONTINUED FROM PAGE 123)

4¾ pretzels back so the auto works is not making friends and influencing people for as little as Guide Scratch thinks they are. He tells me I forget that most of the moves we make with the pretzels are at the auto works expense, and all these points are hundreds of miles and a fortune in freight rates apart so maybe my ¾ of a pretzel is not so much net as it seems.

Finally Guide Scratch throws in the towel, jumps up and announces my play is still awry as we cannot reconcile the two pretzels Rudy has left and that somewhere we must commit some errors in our conversion ratios, and "let's forget it." He is paying off the pancake and the sweep-up is again starting his chores. In brushing off Rudy's table the sweep-up knocks the two pretzels onto the floor.

Rudy loudly chides him, "You should be more careful of my 2000 gross tons of very valuable pig iron I just net on this fine little game." I am struggling to get out of the chair and grabbing for support when I hear this and I freeze in this crouched position.

Guide Scratch is paying off the pancake. When what Rudy says seeps in, Guide Scratch drops the whole wallet into the sweep-up's bucket and gapes at the pretzels on the floor. The sweep-up hands the dripping wallet back to Guide Scratch and he automatically puts it in his pocket without even wringing it out. He keeps staring at the two pretzels.

Suddenly he gives out with a howl and with sweeping gestures and a gleaming countenance scoops up the pretzels and gives them to me shouting, "See, he who has sheets has the bull by the only place to have a bull."

The pancake by this time is burning out the dial on the telephone with wrong numbers as she is now positive we are special cases for the gendarmes in charge of the upholstered sneezer. As we boisterously weave, arms entwined for the exit, Guide Scratch proclaims the only increase in capacity we need in the steel industry is more cerebration, which so far everyone outside the industry, including our duly elected public servants, completely overlook. Except, of course, these guys I start to tell you about in the first place.

Weekly Gallup Polls . . .

American Voters Advocate Tougher Russian Policy

Princeton, N. J.

• • • **An overwhelming majority** of American voters think that the United States is being too soft in its policy toward Russia, according to George Gallup, director, American Institute of Public Opinion.

That is shown in a survey conducted by the institute just before the American-Russian crisis in Berlin came to a head.

As they counter Russia's latest moves in the war of nerves, occupation officers in Berlin will be interested in this indication of sentiment back home:

"Do you think the United States is too soft or too tough (firm) in its policy towards Russia?"

The vote:

	Pct
Too soft	69
Too tough	6
About right	14
No opinion	11

Judging by the results, the country is certainly not calling for a change of policy to one more nearly in line with the views of Henry A. Wallace. On the contrary the voters not only approve the so-called Truman doctrine of containment of Russian expansion, but think a firmer attitude is called for. Only one in 16 (6 pct) votes for a milder course than the present one.

One interesting fact revealed in the survey is that the so-called "proletariat" in America, the manual workers, are no more friendly toward Russia than the "bourgeois" and "capitalist" groups. A favorite propaganda line of the Kremlin is that Western diplomacy is not favored by the common people, but only by the greedy capitalistic classes who are the soul of imperialism.

So far as the United States is concerned it would appear from the following poll results that Russia has more friends among the business and professional classes than among the workers.

	Too Soft Pct	Too Tough Pct	About Right Pct
Bus. and Prof.	67	9	16
Wh. Collar	67	6	16
Farmers	71	5	12
Manual workers	71	4	12

The "no opinion" vote in the above groups ranges between 8 and 13 pct.

The poll finds no important difference of opinion among the major political parties. Because of the nation's bipartisan foreign policy this unanimity might well be expected.

The supporters of Mr. Wallace and his new third party show an attitude different from the voters of the two major parties. But the significant thing is that even among the Wallace supporters there is an almost equal division of opinion. Of those expressing an opinion half said that our policy toward Russia is too soft and half felt it is "too tough."

American public attitudes toward Russia are heavily conditioned by the belief that the Soviets are trying to build themselves into the ruling power of the world. Only a comparatively small percentage of voters think Russia's policy is one of defense against being attacked in another war.

This is shown in the vote on another question in today's survey as follows:

"As you hear and read about Russia these days do you believe Russia is trying to build herself up to be the ruling power of the world, or do you think Russia is just building up protection against being attacked in another war?"

The replies:

	Pct
Ruling power	69
Protection	17
No opinion	14

•

• • • **This is evidence** that the Communist wave in Europe may have passed its peak.

In three key countries, Finland, Sweden and Holland, elections that will provide a crucial test of strength are being held in the near future but reports in those three countries show no indications that the Communist party will make substantial gains.

Evidence Suggests That The Wave of European Communism May Have Reached Its Peak

* * *

In fact, taking the three countries together, the Communists are not likely to do any better than they did in the last election, and possibly not as well.

The last indication of Communist voting strength in a major European country was the Italian election last March in which the Communist front failed to win, polling a maximum of only 31 pct of the popular vote.

The following table shows the poll results and a comparison with the last general elections:

FINLAND

	1945 Election Pct	Poll June 15, 1948 Pct
Social Democratic Party	25.1	28.3
Democratic League (Communists)	23.5	19.8
Agrarian League	21.3	21.8
Coalition Party	15.0	15.0
Swedish People's Party	8.4	8.0
Progressive Party	5.2	5.3
Small Farmers Party	1.2	1.3
Others	0.3	0.5

HOLLAND

	1946 Election Pct	Poll May, 1948 Pct
Roman Catholic People's Party	32	31
Labor Party (Free Democratic League)	29	28
Anti-Revolutionary Party	13	12
Communist Party Netherlands	10	11
Christian Historical Union	8	8
Liberal Party (Party of Freedom)	6	6
Others	2	4

SWEDEN

	1944 Election Pct	Poll June, 1948 Pct
Social Democrats	46.6	42.0
Liberals	12.9	21.7
Conservatives	15.8	14.0
Agrarians	13.7	14.2
Communists	10.3	7.6
Others	0.7	0.5

Cost Sheets Under Fire, But No Large Price Increases Expected

• • • **Cost sheets** were being carefully scanned in major sectors of the machine tool industry this week in the wake of predicted increases in steel prices and wages (THE IRON AGE, July 1) and some segments of the machine tool industry were already moving to bring costs and selling prices into better balance.

Authoritative sources in the trade doubt that machine tool price increases will be widespread at this particular time, however, because there is not enough business in some lines to stand the gaff.

Generally, inquiries were showing some improvement in spite of plant vacation periods and seasonal slumps, but industry observers are watching with much interest, and perhaps some trepidation, for any signs of prolonged shutdown of the steel industry which could very easily have a depressing effect on machine tool sales.

Sellers of machine tools in the Chicago area report that June was a very good month. The last week volume dropped off but June ended up much better than May. Effective July 1 most makers of drilling machinery instituted a price increase of about 6 pct. Builders admit they are looking over costs on other machines and may be forced to make some raises.

Since the last general increase most of the builders have negotiated new labor contracts and they have had at least two increases in casting prices.

The extensive tooling program at the Allison Div. of General Motors in Indianapolis has not all been placed. Machine tool builders declare that the difficulties encountered in machining blades for jet engines probably means that that part of the mcahine tool program will not be finally completed for some time to come. On the average, machine tool observers report that it costs Allison $27.50 to machine a single blade, whereas in order to get the operation on an economical basis, the cost of machining one blade should be somewhere around $1.50.

In addition to the adjustment in prices on drilling machines, some slight adjustments have been made upward on certain types of presses. One seller of machine tools reported that of the machines he handles the most difficult item on a delivery basis was the open back inclinable press. Heavy buying is still being done by the railroads, mostly in heavy lathes and wheel presses.

Electrical equipment on most machine tools is still billed as extras and escalator clauses are still in effect on such equipment. Machine tool companies who accepted orders for Tucker Corp. were very careful. Should Tucker's efforts blow up for any one of a dozen reasons, it appears that none of the sellers or makers of machine tools will be caught.

So far very few inquiries have reached the machine tool industry in this area on defense equipment or program. The A. O. Smith Co. in Milwaukee is reported to have bought two clearing presses for the propeller plant they are rehabilitating in Milwaukee.

The Allied Packaging Co., who held the only contract for processing and storage of aircraft tools in the JANMAT program had their contract terminated July 1. They have accumulated at both Marietta, Ga., and Omaha, Neb., 22,500 tools, 6230 of which have been completely processed. Rust is fast setting in on the balance of this machinery but the AAF has no further funds to continue storing the machines away. It is rumored that in a few months the AAF may again ask for bids on a time and material basis to process some of this machinery, but at the moment the program is dead.

In Detroit, many segments of the machine tool industry are experiencing a lull as the tool and die workers strike goes into its third week. Some builders of special machine tools have been particularly hard hit and one prominent shop has been forced to make its major engineering layoffs since 1938.

The most promising element in the picture at present, according to informed trade sources, is the sustained volume of small orders from small shops which enables some distributors to maintain their dollar volume close to earlier levels. Except for a small order from GM overseas, the big three are quiet at the moment, according to reports. Some machine tool buys by Kaiser-Frazer are expected in the near future. This would be among the first important K-F buys since their recent financing disappointment.

Tightness of certain types of electrical controls has been responsible for slowing up deliveries of machines in some quarters, it is reported.

Cleveland Tapping Machine Co., Hartville, Ohio, has announced two new additions to its national sales organization: Meehan Engineering Co., Syracuse, now handles sales in upstate New York and Stanley Berg & Co., Pittsburgh, and Erie, Pa., is now the representative in western Pennsylvania, West Virginia and southeastern Ohio. The following representatives have been reaffirmed: Wallace Machine Tool Co., New York, for lower New York state and northern New Jersey; Calco Machinery Co., Philadelphia, for eastern Pennsylvania, southern New Jersey, Delaware and Maryland; General Machinery Co., Boston, continues as representative for all of New England except Connecticut, and Melville L. Merrill Machinery, Hartford, for state of Connecticut.

No Chicago Mill for J&L

Pittsburgh

• • • **Jones & Laughlin** Steel Corp. has apparently given up any thought of building a new mill in the Chicago district. On July 5 it sold 960 acres of land in Hammond, Ind., which it has held since 1922 to Standard Oil Co. (Ind.).

Chicago Still Over Formula; Others Hold Back

New York

• • **The Chicago market** coninues to be hot with No. 1 heavy nelting going at $39.50 to $41. Brokers are freely paying $41 and he bottom price in the spread is nly nominal. Pittsburgh, Cleveand and the Valley markets have ot yet followed suit on the breakhrough, however, as consumers in hese areas seriously doubt that anther two dollars would bring them ny additional material and they ave not abandoned their position.

The break has been reflected in everal of the lesser markets—Deroit and Boston in particular. In Buffalo the showdown has been postponed as many producers are in he midst of vacation periods, but serious dickering will begin when operations are resumed and whether or not the formula can hold there, at least temporarily, should be determined in another two weeks. Cincinnati prices have also held, but increasing out-of-district buying is reportedly giving the market extra strength.

The markets in general have rarely been as strong as they are at the moment and scrap has rarely been so scarce. The tonnages being shipped in many cases are downright sad in comparison to movements of the past.

Possible effects of the Supreme Court basing point ruling on the scrap trade are being kicked around. Apparently there is no compulsion as yet planned to force alteration of scrap practices, but it is generally agreed that what applies to new steel must apply to old.

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PITTSBURGH—A very strong undertone dominates the openhearth steel market. Some dealers who would normally sell 500 tons are down to selling a carload at a time. But the actual strength reported in other areas has not been reflected in any new higher priced orders. Mills are not getting all they want, but they know they wouldn't get any more even if they ran the price up $2. The only actual strength came from the latest railroad lists where specialties and scrap rails sold up half a dollar. Debate on the formula system of selling scrap was rife with the consensus being it was just as illegal as the multiple basing point system of selling steel. However, it was doubted if it would go out as quickly.

•

CHICAGO—On appraisal of all factors in last week's hectic market heavy melting scrap is quotable from $39.50 to $41.00. The only reason for holding the low figure is that some earmarked scrap is still moving at this price. Brokers were freely offering $41.00. Some of the mills denied they had paid over the previous free market price of $40.50. Other mills now trying to place new orders admit they can't buy at reasonable figures and won't buy until they absolutely are forced to do so. Steel foundries are grabbing bonafide No. 1 heavy melting at around $44.00 gross ton on track.

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PHILADELPHIA—Prices of all grades of scrap are holding at previous levels, but there is some indication of testing in the market for foundry cast grades. This is permitted by the vacation closings of foundries coupled with the furnace relining of the principal foundry pig iron supplier in this area. Brokers are having difficulty in filling orders because of the bullish attitude of dealers who see metals scrap rising sharply and because of shipments of scrap from eastern markets to remote mills, both developments acting to cut down available supplies. Dealers report a rise in the intake of light steel grades and a decline in heavy metal. The Portsmouth Navy Yard unprepared scrap is reported to have gone at $37.16 plus $6.49 freight. Prepared scrap which will move as low phos went at $37.80 f.o.b. Norfolk.

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CLEVELAND—While the market here and in the Valley is tremendously strong, mills are not as yet paying over the formula. Most of the charter members of the formula club are going through the motions of holding fast, but the inclination to meet price competition is there. Nobody wants to put in the first order. A price vendetta now would probably raise scrap to an all time high. For the first time in many months scrap is being held and brokers are having plenty of trouble covering. At the moment, a of trouble covering. Shipments are off, but most of the material moving is at the formula because it is either earmarked or allocated or both. Brokers can cover very little at the formula in free scrap and tonnages of openhearth and low phos in this category are bringing stiff prices. The market wants to go up and observers believe is about ready to throw off the shackles.

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DETROIT—The combined effect of reported break-throughs in other major markets, local brokers covering on previous contracts and possible realization that severe scrap shortages may develop here during the winter months pulled scrap prices away from formula here this week for the first time in more than six months. While local mills are continuing to pay formula prices and some brokers are accepting orders for limited tonnages at these prices, it is generally acknowledged that the big test of whether prices here will continue to rise or slip back to formula levels has yet to develop.

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BUFFALO—The market was dull with many leading industrial producers closed for vacations. Scrap yards took advantage of the letdown in many cases to give their own workers vacations. A little business in choice low phos scrap at $46 on cars Buffalo was the chief activity of the week, although most of that material was moving at $44.75. A showdown on the formula price for openhearth grades, however, is expected soon as some leading consumers continue to pick up scrap off the ground.

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BIRMINGHAM—Demand is particularly heavy for steelmaking scrap in this district and there has been no drop in the consumption of other grades. Most of the material produced in the Birmingham area is being used locally as it has for several weeks. Considerable tonnages of steel scrap are reported moving to northern mills from Florida and from North and South Carolina.

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NEW YORK—The market which has been slowed to a walk for some time can best be described this week as creeping, at least on paper. The market is very strong and there is apparently little relief in sight, although a couple large shipments expected toward the end of the month may provide some stimulus. Various quarters expressed concern as to what effect the desertion of the basing point system by the mills will have on the scrap market. But observers believe present conditions make this as good a time as any for new arrangements and generally expect adjustments to be made that will be satisfactory all around.

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CINCINNATI—Major consumers are sticking to the formula at the moment, despite a strong market which has picked up sympathetic strength on developments in other districts. Mills have about six weeks' inventory on the ground and are hoping to ride it out, but out-of-district buying continues to be disturbing.

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BOSTON—The big fellows are still sticking to formula prices and in at least one case No. 2 steel has been shipped from Ohio to Worcester rather than pay above formula here. However, other mills are paying more for Nos. 1 and 2 steel, sales at $35 to $36 being reported for No. 1 and $33 to $34 for No. 2. Foundries are down for vacation and only cast moving is going to Pennsylvania, heavy breakable at $54.50 a ton f.o.b. and in one instance at $55.

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ST. LOUIS—Speculative buying is occurring in this market. Brokers are paying more than formula prices. But mills are staying away from buying at such quotations. Their attempt to remain aloof may be in vain if the strength in other areas spreads.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$40.00 to**	**$40.50**
RR. hvy. melting	**41.00 to**	**41.50**
No. 2 hvy. melting	**40.00 to**	**40.50**
RR. scrap rails	56.00 to	57.00
Rails 2 ft and under	**62.50 to**	**63.50**
No. 1 comp'd bundles	**40.00 to**	**40.50**
Hand bdld. new shts.	**40.00 to**	**40.50**
Hvy. axle turn.	**41.50 to**	**42.00**
Hvy. steel forge turn.	**41.50 to**	**42.00**
Mach. shop turn.	**35.50 to**	**36.00**
Shoveling turn.	**38.00 to**	**38.50**
Mixed bor. and turn.	**35.50 to**	**36.00**
Cast iron boring	**38.00 to**	**38.50**
No. 1 cupola cast	**63.00 to**	**64.50**
Hvy. breakable cast	**52.00 to**	**53.00**
Malleable	**76.00 to**	**77.00**
RR. knuck, and cup	56.00 to	57.00
RR. coil springs	56.00 to	57.00
R.R. leaf springs	56.00 to	57.00
Rooled steel wheels	56.00 to	57.00
Low phos.	48.50 to	49.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy, melting	$39.50 to	$41.00
No. 2 hvy. melting	39.50 to	41.00
No. 1 bundles	39.50 to	41.00
No. 2 dealers' bundles	39.50 to	41.00
Bundled mach. shop turn.	39.50 to	41.00
Galv. bundles	36.50 to	38.00
Mach. shop turn.	34.50 to	35.50
Short shov. turn.	36.50 to	37.50
Cast iron borings	37.00 to	38.00
Mix. borings & turn.	34.50 to	35.50
Low phos. hvy, forge	48.00 to	50.00
Low phos. plates	46.00 to	47.00
No. 1 RR. hvy. melt.	41.75 to	43.50
Rerolling rails	58.00 to	60.00
Miscellaneous rails	56.00 to	57.00
Angles & splice bars	58.00 to	59.00
Locomotive tires, cut	55.00 to	56.00
Cut bolster & side frames.	49.00 to	50.00
Standard stl. car axles	62.00 to	64.00
No. 3 steel wheels	54.00 to	55.00
Couplers & knuckles	54.00 to	55.00
Rails, 2 ft and under	59.50 to	60.00
Malleable	77.00 to	78.00
No. 1 mach. cast	69.00 to	71.00
No. 1 agricul. cast	62.00 to	64.00
Heavy breakable cast	58.00 to	64.00
RR. grate bars	65.00 to	66.00
Cast iron brake shoes	58.00 to	60.00
Cast iron carwheels	61.00 to	62.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to	$39.50
No. 2 hvy. melting	38.50 to	39.50
No. 1 bundles	38.50 to	39.50
No. 2 bundles	38.50 to	39.50
Mach. shop turn.	33.00 to	33.50
Shoveling turn.	35.00 to	35.50
Cast iron borings	32.50 to	33.00
Mixed bor. & turn.	32.50 to	33.00
Low phos., plate	46.00 to	48.00
No. 1 cupola cast	63.00 to	64.00
Hvy. breakable cast	55.00 to	56.00
Rails 18 in. & under	60.00 to	61.00
Rails random length	51.00 to	52.00
Drop broken	67.00 to	69.00

BOSTON

Dealers' buying prices, per gross ton, f.o.b. Boston

No. 1 heavy. melting	$35.00 to	$36.00
No. 2 hvy. melting	33.00 to	34.00
Nos. 1 and 2 bundles	31.65 to	31.90
Busheling	31.65 to	31.90
Shoveling turn.	....	28.90
Machine shop trun.	....	26.90
Mixed bor. & turn.	....	26.90
Cl'n cast chem. bor.	**36.00 to**	**37.00**
No. 1 machinery cast	**55.00 to**	**57.00**
No. 2 machinery cast	54.00 to	55.00
Heavy breakable cast	53.00 to	55.00
Stove plate	**51.50 to**	**52.00**

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	$35.50 to	$37.00
No. 2 hvy. melting	35.00 to	37.00
No. 1 bundles	35.50 to	37.00
New busheling	35.50 to	37.00
Flashings	35.50 to	37.00
Mach. shop turn.	29.50 to	31.00
Shoveling turn.	30.50 to	32.00
Cast iron borings	30.50 to	32.00
Mixed bor. & turn.	29.00 to	30.50
Low phos. plate	40.50 to	42.00
No. 1 cupola cast	52.00 to	**55.00**
Heavy breakable cast	45.00 to	**50.00**
Stove plate	48.00 to	50.00
Automotive cast	**52.00 to**	**55.00**

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$42.00 to**	**$43.00**
No. 2 hvy. melting	**38.50 to**	**39.00**
No. 1 bundles	**42.00 to**	**43.00**
No. 2 bundles	**38.50 to**	**39.00**
Mach. shop turn.	**34.50 to**	**35.00**
Shoveling turn.	**34.50 to**	**35.00**
Mixed bor. & turn.	**34.50 to**	**35.00**
Clean cast chemical bor.	42.00 to	44.00
No. 1 machinery cast	66.00 to	68.00
No. 1 mixed yard cast	62.00 to	63.00
Hvy. breakable cast.	**63.00 to**	**64.00**
Clean auto cast.	**65.00 to**	**66.00**
Hvy. axle forge turn.	**44.00 to**	**45.00**
Low phos. plate	**48.00 to**	**49.00**
Low phos. punchings	**48.00 to**	**49.00**
Low phos. bundles	**46.00 to**	**47.00**
RR. steel wheels	52.00 to	53.00
RR. coil springs	52.00 to	53.00
RR. malleable	75.00 to	78.00
Cast iron carwheels	68.00 to	70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to	$42.00
No. 2 hvy. melting	37.50 to	38.50
Bundled sheets	37.50 to	38.50
Mach. shop turn.	33.00 to	33.50
Locomotive tires, uncut	47.00 to	48.00
Mis. std. sec. rails	49.00 to	50.00
Steel angle cars	48.50 to	49.50
Rails 3 ft and under	53.00 to	55.00
RR. steel springs	49.00 to	50.00
Steel car axles	**54.00 to**	**55.00**
Grate bars	**59.00 to**	**60.00**
Brake shoes	**57.00 to**	**58.00**
Malleable	**72.00 to**	**73.00**
Cast iron car wheels	61.00 to	62.00
No. 1 machinery cast	65.00 to	67.00
Hvy. breakable cast	59.00 to	60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy, melting	....	**$37.50**
No. 2 hvy, melting	....	**37.50**
No. 2 bundles	....	**37.50**
No. 1 busheling	....	**37.50**
Long turnings	**$25.00 to**	**26.00**
Shoveling turnings	**27.00 to**	**28.00**
Cast iron borings	**26.00 to**	**27.00**
Bar crops and plate	**42.50 to**	**43.50**
Structural and plate	**42.50 to**	**43.50**
No. 1 cupola cast.	**64.00 to**	**67.00**
Stove plate	63.00 to	**64.00**
No. 1 RR. hvy, melt.	....	38.50
Steel axles	51.00 to	52.00
Scrap rails	44.00 to	45.00
Rerolling rails	**51.00 to**	**53.00**
Angles & splice bars	**51.00 to**	**53.00**
Rails 3 ft & under	**52.00 to**	**55.00**
Cast iron carwheels	**50.00 to**	**55.00**

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to	$40.50
No. 2 hvy. melting	40.00 to	40.50
Mach. shop turn.	35.00 to	35.50
Short shov. turn.	37.00 to	37.50
Cast iron borings	36.00 to	36.50
Low phos.	45.00 to	45.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	**$36.50 to**	**$37.50**
No. 2 hvy. melting	....	**34.50**
No. 2 bundles	....	**34.50**
Mach. shop turn.	**29.00 to**	**29.50**
Mixed bor. & turn.	**29.00 to**	**29.50**
Shoveling turn.	**31.00 to**	**32.00**
No. 1 cupola cast	**55.50 to**	**56.50**
Clean auto cast	**55.50 to**	**56.50**
Hvy. breakable cast	56.00 to	57.50
Charging box cast	56.00 to	57.50
Unstrp. motor blks.	**52.00 to**	**53.00**
Cl'n cast chem. bor.	**34.50 to**	**35.50**

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy, melting	**$39.75 to**	**$45.00**
No. 2 hvy. melting	....	**39.75**
No. 1 bundles	....	**39.75**
No. 2 bundles	....	**39.75**
No. 1 busheling	....	**39.75**
Mach. shop turn.	34.75 to	35.50
Shoveling turn.	35.00 to	36.50
Cast iron borings	....	**35.75**
Mixed bor. & turn.	....	**34.75**
No. 1 cupola cast.	**64.00 to**	**65.00**
Mixed cupola cast.	**60.00 to**	**61.00**
Charging box cast.	**56.00 to**	**57.00**
Stove plate	**60.00 to**	**61.00**
Stove auto cast.	**60.00 to**	**61.00**
RR. malleable	**70.00 to**	**75.00**
Small indl. malleable	**47.00 to**	**49.00**
Low phos. plate	**44.75 to**	**46.00**
Scrap rails	**50.00 to**	**52.00**
Rails 3 ft & under	**57.00 to**	**58.00**
RR. steel wheels	**51.00 to**	**52.00**
Cast iron carwheels	**51.00 to**	**52.00**
RR. coil & leaf spgs.	**51.00 to**	**52.00**
RR. knuckles & coup.	**51.00 to**	**52.00**

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$39.50 to**	**$40.00**
No. 2 hvy. melting	**39.50 to**	**40.00**
No. 1 bundles	**39.50 to**	**40.00**
No. 1 busheling	**39.50 to**	**40.00**
Drop forge flashings	**39.50 to**	**40.00**
Mach. shop turn.	**34.50 to**	**35.00**
Shoveling turn.	**35.50 to**	**36.00**
Steel axle turn.	**39.50 to**	**40.00**
Cast iron borings	**35.50 to**	**36.00**
Mixed bor. & turn.	**35.50 to**	**36.00**
Low phos.	**44.50 to**	**45.00**
No. 1 machinery cast	**73.00 to**	**76.00**
Malleable	**74.00 to**	**76.00**
RR. cast.	**73.00 to**	**74.00**
Railroad grate bars	**60.00 to**	**62.00**
Stove plate	**61.00 to**	**62.00**
RR. hvy. melting	**40.00 to**	**40.50**
Rails 3 ft & under	**60.00 to**	**61.00**
Rails 18 in. & under	**62.00 to**	**63.00**

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	....	**$25.00**
No. 2 hvy. melting	....	**25.00**
No. 2 bales	....	**25.00**

Per gross ton delivered to consumer:

No. 3 bales	....	**$19.50**
Mach. shop turn.	....	**16.00**
Elec. furn. 1 ft under	**$32.00 to**	**34.00**
No. 1 cupola cast	50.00 to	51.00
RR. hvy. melting	....	**26.00**

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	....	**$25.00**
No. 2 hvy. melting	....	**25.00**
No. 1 bales	....	**25.00**
No. 2 bales	....	**25.00**
No. 3 bales	....	**19.00**
Mach. shop turn.	....	**17.50**
No. 1 cupola cast.	**$45.00 to**	**50.00**
RR. hvy. melting	....	**26.00**

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	....	**$26.00**
Elec. furn. 1 ft and under	....	**30.00**
No. 1 cupola cast.	....	**40.00**
RR. hvy. melting	....	**26.00**

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting		**$22.00***
No. 1 bundles		**22.00***
No. 2 bundles		**21.50***
Mechanical bundles		**20.00***
Mixed steel scrap		**19.00***
Mixed borings and turnings		**17.00***
Rails, remelting		**23.00***
Rails, rerolling		**26.00***
Bushelings		**17.00***
Bushelings, new fact, prep'd		**21.00***
Bushelings, new fact, unprep'd		**16.00***
Short steel turnings		**17.00***
No. 1 cast	**$42.00 to**	**46.00**
No. 2 cast	**35.00 to**	**37.00**

***Ceiling Price.**

istribution Pattern Remains Unchanged; Price Increases Likely

ew York

• • **Producers of** copper, lead and inc do not expect to make any arly changes in their methods of ricing these metals as the result f the action taken last week by the Jnited States Steel Corp. Prouceurs are absorbing freight costs o meet competition at established elivery points in accordance with vell known industry patterns, and hantom freight charges are used s the basis for figuring delivered rices for some products in certain reas.

There is as yet, however, no urency to be found among producers o upset the established distribuion patterns before further legal ecisions make this action mandaory. Some officials believe that beore such a step becomes necessary, ongressional action may be taken o acknowledge and confirm the esablished practices for setting cometitive prices. Freight costs, while rowing rapidly, are still a relaively small element of cost in the onferrous metals and the FTC has ot yet designated any of these on ts preferred list of industries for arly action designed to control retrictive trade practices.

Speculation in industry circles entered around the effects on netals prices that would be likely o result from the current wave of vage negotiations. The Phelps Dodge plant negotiations have all een settled with an increase of 12¢ n hour. Some observers believe hat this figure can be expected to et the pattern for the industry. However the threat of strikes at everal plants was evident last veek where negotiations were still nderway although the contract peiod had expired. Pending negotiaions include the American Zinc, Lead & Smelting Co. plant at East St. Louis, the American Smelting & Refining Co. plants at Perth Amoy and Barber, N. J. and the Kenecott Copper Co. Utah operations.

Negotiations were confused in ome cases by the failure of the inernational officers of the Internaional Union of Mine, Mill & Smelter Workers to sign non-Communist ffidavits and the unwillingness of management to conclude an agreement on this basis. In Utah, it is reported that a number of locals were in process of seceding from the union because of alleged Communist domination. St. Joseph Lead Co. plants at Herculaneum and Flat River, Mo. were on strike due to failure to agree on fringe issues. The Eagle-Picher strike is now in its third week and has seriously retarded the production of zinc ores by the Tri-State District.

The strikes have already exerted their effect on supplies of lead and zinc because of their already tight position. Premium prices being asked for domestic secondary and imported foreign lead have reached fantastic highs of 21¢ to 23¢ per lb. Consumers report increasing difficulty in obtaining zinc of every grade at domestic market prices.

Information in this article comes from reliable trade sources. It does not mean that the nonferrous industry may not at some later date go f.o.b. mill.—Ed.

Most observers believe that the coming price increase in zinc will not be realized before the end of the Eagle-Picher strike, since it is the major producer in the area. It is conceivable, however, that there may be earlier price action if consumers generally are required to pay over-market premiums to keep operating.

The stability of the price of copper as affected by the wage agreements is an open question in the industry. It is acknowledged that there are some marginal producers who may be unable to operate profitably at higher wage rates and current high freight costs even at the domestic price of 21.50¢. A price rise movement could originate from them or from custom smelters who would be affected primarily if copper scrap should dry up at present prices.

A most important new factor in the market is contained in a provision of the ECA Appropriation Act which reads as follows: "No funds made available under the authority of this Act shall be used for the purchase in bulk of any commodities at prices higher than the market price prevailing in the United States at the time of the purchase adjusted for differences in the cost of transportation to destination, quality and terms of payment."

Much depends on the interpretation of this passage by ECA authorities and Administration officials because export sales at prices higher than the domestic market represent a large portion of the copper and zinc foreign business. If interpreted strictly, some sellers to the foreign market would find it advisable to withdraw. It is considered probable that a strict enforcement of the measure would serve to cut off a large part of ECA sales of the metals at once, and it might well be responsible for raising the domestic market prices to world levels.

The foreign copper market ranges from 21.50¢ to 22.75¢ f.a.s. New York. Market sources believe that the only foreign sellers at the low price are the Chilean producers. However they have been able to control the weighted average price by selling a major share of the tonnage so that it has not exceeded the domestic refinery price by more than ½¢ per lb.

The zinc export differential has been even greater. Prime Western and other grades have been sold at Gulf Ports at premiums of 1¢ to 1¼¢ per lb above the East St. Louis price.

Nonferrous Metals Prices

	July 7	July 8	July 9	July 10	July 12	July 13
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	17.30	17.30	17.30	17.30	17.30	17.30

Primary Metals

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, 10,000 lb, f.o.b. shipping point, freight allowed	16.00
Aluminum pig, f.o.b. shipping point	15.00
Antimony, American, Laredo, Tex.	35.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per try oz.	$100 to $110
Lead, St. Louis	17.30
Lead, New York	17.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$76 to $78
Nickel, electro, f.o.b. New York	36.56
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$88 to $91
Silver, New York, cents per oz.	74.625
Tin, Grade A, New York	$1.03
Zinc, East St. Louis	12.00
Zinc, New York	12.65
Zirconium copper, 20 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.50–20.00
No. 120	19.00–19.50
No. 123	18.50–19.00
80-10-10 ingot	
No. 305	25.25
No. 315	22.25
88-10-2 ingot	
No. 210	31.00
No. 215	29.00
No. 245	23.25–23.75
Yellow ingot	
No. 405	15.25–16.00
Manganese bronze	
No. 421	19.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	25.00–26.00
0.60 copper, max.	25.00–25.50
Piston alloys (No. 122 type)	22.50–23.25
No. 12 alum. (No. 2 grade)	23.50–23.75
108 alloy	23.50–23.75
195 alloy	22.50–23.00
13 alloy	25.00–26.00
AXS-679	23.00–24.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct.-95½ pct.	23.25–23.75
Grade 2—92 pct-95 pct.	22.50–23.00
Grade 3—90 pct-92 pct.	22.25–22.75
Grade 4—85 pct-90 pct.	22.00–22.50

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32⅜
Rolled, oval, straight, delivered	34.34
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, cast, 99.99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 100 oz lots per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	44.00
Copper sulfate, 99.5, crystals, bbls.	12.50
Nickel salts, single or double, 425 lb bbls. frt. allowed	16.50
Nickel chloride, 300 lb bbl.	23.00
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	35.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 25.7¢; 4S, 61S-O, 27.8¢; 52S, 29.9¢;24S-O, 24S-OAL, 28.8¢; 75S-O, 75S-OAL, 35.3¢. 0.081 in., 2S, 3S, 26.8¢; 4S, 61S-O, 29.2¢; 52S, 31.8¢; 24S-O, 24S-OAL, 29.9¢; 75S-O, 75S-OAL, 37.0¢. 0.032 in., 2S, 3S, 28.5¢; 4S, 61S-O, 32.5¢; 52S, 35.2¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 46.6¢.

Plate: ¼ in. and heavier; 2S, 3S, 22.8¢; 4S-F, 25.0¢; 52S, 26.1¢; 61S-O, 25.6¢; 24S-F, 24S-FAL, 26.1¢; 75S, 75S-AL, 32.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; 3/16 to 7/32 in., 32.5¢ to 53.5¢; 9/64 to 5/32 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 33¢ to 29.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 35.5¢ to 31¢.

Screw Machine Stock: Drawn, ⅛ to 11/32 in., 11S-T3, R317-T4, 48¢ to 34¢; cold-finished, ⅜ to 1½ in., 11S-T3, 37.5¢ to 34.5¢; ⅝ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1 9/16 to 3 in., 11S-T3, 34.5¢ to 31.5¢; 2⅛ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 35¢ to 25.5¢; 52S, 43c to 31c; 56S, 45.5c to 37¢; 17S-T4, 49¢ to 33.5¢; 61S-T4, 43.5c to 33c.; 75S-T6, 75¢ to 54¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 48¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16 $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	34.78	....	35.18
Copper, hot-rolled	....	31.28	....
Copper, drawn	....	32.28	....
Low brass	35.86*	32.64	32.95
Yellow brass	34.42*	31.10	31.41
Red brass	36.39*	33.17	33.48
Naval brass	31.53	30.28	36.22
Leaded brass	29.89	25.94	....
Commercial bronze	37.18*	34.21	34.52
Manganese bronze	35.12	33.62	39.72
Phosphor bronze, 5 pct	55.90*	54.40	54.15
Muntz metal	31.05	29.80	34.24
Everdur, Herculoy, Olympic, etc.	....	38.75	39.81
Nickel silver, 10 pct	....	43.68	41.54
Architectural bronze	29.89	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	19⅛	18⅜
Yellow brass	15⅝	14¾
Red brass	17½	16¾
Commercial bronze	17⅝	16⅞
Manganese bronze	15¼	14⅜
Leaded brass rod ends	15⅜	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper, wire	18.50
No. 2 copper, wire	17.50
Light copper	16.50
Refinery brass	16.50–16.75*

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	18.50
No. 2 copper, wire	17.50
Light copper	16.50
No. 1 composition	14.50
No. 1 comp. turnings	14.00
Rolled brass	11.00
Brass pipe	11.25
Radiators	12.00
Heavy yellow brass	10.50

Aluminum

Mixed old cast	11.50
Mixed old clips	11.[illegible]
Mixed turnings, dry	11.0
Pots & pans	12.00
Low copper	12.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16¾—17¼
No. 2 heavy copper and wire	15¾—16¼
Light copper	14½—15
Auto radiators (unsweated)	10 —10½
No. 1 composition	13 —13½
No. 1 composition turnings	12½—13
Clean red car boxes	10 —10¼
Cocks and faucets	10 —10½
Mixed heavy yellow brass	8½— 9
Old rolled brass	10 —10¼
Brass pipe	10½—10¾
New soft brass clippings	12½—13
Brass rod ends	10¼—10¾
No. 1 brass rod turnings	9¾—10¼

Aluminum

Alum, pistons and struts	7½— 8
Aluminum crankcases	10 —10½
2S aluminum clippings	11½—12
Old sheet & utensils	10 —10½
Dry borings and turnings	4½— 5
Misc. cast aluminum	10 —10½
Dural clips (24S)	10 —10½

Zinc

New zinc clippings	8 — 8½
Old zinc	6 — 6½
Zinc routings	3 — 3½
Old die cast scrap	4 — 4½

Nickel and Monel

Pure nickel clippings	17 —18
Clean nickel turnings	13 —14
Nickel anodes	17 —18
Nickel rod ends	17 —18
New Monel clippings	12 —13
Clean Monel turnings	8 — 9
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	9 —10
Nickel silver clippings, mixed.	8 — 8½
Nickel silver turnings, mixed.	6½ — 7

Lead

Soft scrap lead	15½—16
Battery plates (dry)	10 —10¼

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	81 —83
No. 1 pewter	65 —67
No. 1 auto babbitt	50 —52
Mixed common babbitt	14¼—14¾
Solder joints	19 —19½
Siphon tops	50 —52
Small foundry type	17½—18
Monotype	16¼—16¾
Lino. and stereotype	15½—16
Electrotype	13½—14
New type shell cuttings	14½—15
Hand picked type shells	6½— 7
Lino and stereo dross	8 — 8½
Electro dross	6 — 6½

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major basing points: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	July 13, 1948	July 6, 1948	June 15, 1948	July 15, 1947
Hot-rolled sheets	2.775	2.775	2.775	2.50
Cold-rolled sheets	3.495	3.495	3.495	3.20
Galvanized sheets (10 ga.)	3.913	3.913	3.913	3.55
Hot-rolled strip	2.775	2.775	2.775	2.50
Cold-rolled strip	3.535	3.535	3.535	3.20
Plates	2.93	2.93	2.93	2.65
Plates wrought iron	7.25	7.25	7.25	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.70	$6.70	$6.70	$5.75
Tinplate, electro (0.50 lb)	5.90	5.90	5.90	5.05
Special coated mfg. ternes	5.80	5.80	5.80	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	2.875	2.875	2.875	2.60
Cold-finished bars	3.483	3.483	3.483	3.20
Alloy bars	3.213	3.213	3.213	3.05
Structural shapes	2.767	2.767	2.767	2.50
Stainless bars (No. 302)	26.00	26.00	26.00	26.00
Wrought iron bars	8.65	8.65	8.65	6.15
Wire: (cents per pound)				
Bright wire	3.608	3.608	3.608	3.30
Rails: (dollars per 100 lb)				
Heavy rails	$2.725	$2.725	$2.725	$2.50
Light rails	3.05	3.05	3.05	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00†	$45.00†	$45.00†	$42.00
Slabs, rerolling	45.00†	45.00†	45.00†	42.00
Forging billets	54.00†	54.00†	54.00†	50.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	3.133	3.133	3.133	2.55
Skelp	2.888	2.888	2.888	2.35

† Net ton

Pig Iron: (per gross ton)	July 13, 1948	July 6, 1948	June 15, 1948	July 15, 1947
No. 2, foundry, Phila.	$44.74*	$44.74*	$44.74*	$38.22
No. 2, Valley furnace	**43.50**	39.50	39.50	33.50
No. 2, Southern Cin'ti	45.47	45.47	45.47	34.75
No. 2, Birmingham	39.38	39.38	39.38	29.88
No. 2, foundry, Chicago†	39.00	39.00	39.00	33.00
Basic del'd Philadelphia	44.24*	44.24*	44.24*	38.89
Basic, Valley furnace	**43.00**	39.00	39.00	33.00
Malleable, Chicago†	39.50	39.50	39.50	33.50
Malleable, Valley	**43.50**	39.50	39.50	33.50
Charcoal, Chicago	65.55	65.55	65.55	45.99
Ferromanganese‡	145.00	145.00	145.00	135.00

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† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
* Revised.

Scrap: (per gross ton)	July 13, 1948	July 6, 1948	June 15, 1948	July 15, 1947
Heavy melt'g steel, P'gh.	$40.25	40.25	$40.25	$38.75
Heavy mlt'g steel, Phila.	42.50	42.50	42.50	37.75
Heavy melt'g steel, Ch'go	**40.25**	40.00	39.25	36.75
No. 1, hy, comp. sh't, Det.	**36.25**	35.50	35.50	34.00
Low phos. Young'n	45.25	45.25	45.25	43.25
No. 1, cast, Pittsburgh	63.75	63.75	63.75	38.25
No. 1, cast, Philadelphia	67.00	67.00	67.00	34.00
No. 1, cast, Chicago	70.00	70.00	69.50	45.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$13.75	$13.50	$12.75	$12.00
Foundry coke, prompt	16.50	16.50	16.50	13.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro. Conn.	21.50	21.50	21.50	21.50
Copper, Lake Conn.	21.625	21.625	21.625	21.625
Tin, Grade A, New York	$1.03	$1.03	$1.03	80.00
Zinc, East St. Louis	12.00	12.00	12.00	10.50
Lead, St. Louis	17.30	17.30	17.30	14.80
Aluminum, virgin	16.00	16.00	15.00	15.00
Nickel, electrolytic	36.56	36.56	36.56	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	35.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
July 13, 1948	3.24473¢ per lb.	$41.84 per gross ton	$41.00 per gross ton
One week ago	3.24473¢ per lb.	$40.51* per gross ton	$40.91 per gross ton
One month ago	3.24473¢ per lb.	$40.51* per gross ton	$40.66 per gross ton
One year ago	2.85664¢ per lb.	$33.43 per gross ton	$37.75 per gross ton

* Revised

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1948	3.27585¢ Feb. 17	3.22566¢ Jan. 1	$41.84 July 13	$39.58 Jan. 6	$41.83 Jan. 29	$39.75 Mar. 9
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound unless otherwise indicated. Extras apply. Delivered prices are minimum and do not reflect 3 pct tax on freight. Industry practice has discontinused arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Arbitrary delivered prices. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) from 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Deliverd Los Angeles; add 0.55¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. (18) 24 to 14 gage, up to 48 in.; 26 gage, up to 42 in.; 30 to 27 gage, up to 36 in.

PRODUCTS	Prices at basing points apply only to the sizes and grades produced at those points.												DELIVERED TO		
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Francisco, Los Angeles	Detroit[10]	New York	Philadelphia
INGOTS Carbon forging	$46.00	Rerolling ingots—$36.00 per net ton f.o.b. mill (Spot market as $75 to $90 per gross ton)													
Alloy	$56.00										Canton = $56.00				
BILLETS, BLOOMS, SLABS Carbon, rerolling[17]	$45.00	$45.00	$45.00	$47.00	$45.00	$45.00		$45.00							
Carbon forging billets	$54.00	$54.00	$54.00	$54.00	$54.00	$54.00	(per net ton)								
Alloy	$66.00	$66.00				(Bethlehem, Massillon, Canton = $66.00)									
PIPE SKELP	2.85 to 2.90						2.90								
WIRE RODS	2.80 to 3.55	2.80 to 3.80		2.80 to 3.05	2.85						Worcester = 2.90	3.5245[13]			
SHEETS Hot-rolled[6]	2.75 to 2.80	2.75 to 2.80	2.75	2.80	2.75 to 2.80	2.80	2.75 to 2.80	2.80		Ashland, Ky. = 2.80		3.494[16] to 3.6875	2.96 to 3.01	3.18 to 3.31	3.06 to 3.24
Cold-rolled[1]	3.45 to 3.50	3.45 to 3.55	3.45	3.50		3.55	3.55	3.55[18]	3.65	3.50			3.66	3.93 to 4.01	3.81 to 3.94
Galvanized (10 gage)	3.85	3.95	3.85 to 3.95		3.85 to 3.95		3.95	3.95	4.0	3.95	Ashland = 3.95	4.624[16]		4.33	4.21
Enameling (12 gage)	3.85	3.75	3.75 to 3.85	3.95			3.95		4.05	3.85			4.11 to 4.16	4.41	4.34
Long ternes[2] (10 gage)	4.05		4.05											4.61	4.54
STRIP Hot-rolled[3]	2.80	2.75 to 2.80	2.75	2.75 to 2.80	2.75		2.75 to 2.80					3.554[16] to 3.9125	2.96 to 3.01	3.38	3.29
Cold-rolled[4]	3.50	3.55 to 3.65	3.55	3.45 to 3.50			3.55			Worcester = 3.65 to 3.75			3.66	4.05	3.99
TINPLATE Cokes, 1.50 lb,[5] base box	6.70	6.70	6.70		6.80			6.80	6.90	(Warren, Ohio = $6.80)				7.16	7.06
Electrolytic 0.25, 0.50, 0.75 lb, box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb coke base box price.														
BLACKPLATE, h.e., 29 ga.[11]	4.65	4.65	4.65					4.75	4.85					5.13	5.01
BARS Carbon Steel	2.85 to 2.90	2.85 to 2.90	2.85	2.90	2.85 to 2.90	2.90	2.85 to 2.90					3.579[16] to 3.629[16]	3.06 to 3.11	3.40	3.34
Reinforcing (billet)[7]	2.70 to 2.80	2.70 to 2.80	2.70		2.70		2.70	2.75				3.325[16]		3.13	3.01
Cold-finished[1]	3.45 to 3.55	3.45 to 3.55		3.45									3.61 to 3.76	4.01	3.94
Alloy, hot-rolled	3.20	3.20 to 3.30	3.20			3.30	3.20	Bethlehem, Massillon, Canton = 3.30						3.56	3.48
Alloy, cold-drawn	4.00 to 4.10	4.00 to 4.10		4.00		4.10		Massillon, Canton = 4.10						4.56	4.49
PLATE Carbon steel[12]	2.90 to 2.95	2.90 to 2.95	2.90 to 2.95	2.95	2.85 to 2.90		2.90 to 2.95	Coatesville = 3.45, Claymont = 3.65 2.95 Geneva, Utah = 2.90				3.8375[14]		3.33	3.21
Floor plates	4.05	3.95 to 4.05	3.95	4.05										4.61	4.54
Alloy	3.70	3.70	3.70						Coatesville = 4.80					4.26	4.19
SHAPES, Structural	2.75	2.75 to 2.80	2.75 to 2.80		2.75		Bethlehem = 2.80, Geneva, Utah = 2.75					3.424[16] to 3.49		3.06	2.98
MANUFACTURERS' WIRE[9] Bright	3.45 to 3.80	3.45 to 4.05		3.45	3.45 to 3.55					Worcester = 3.55 Duluth = 3.50		4.4645[13]		3.95	3.94
Spring (high carbon)	4.50	4.50		4.50					Worcester = 4.60 Trenton, Duluth = 4.75			5.5345[13]		5.00	4.99
PILING, Steel sheet	3.30	3.30				3.30								3.83	3.79

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel No. 304	Chromium Nickel No. 302	Straight Chromium No. 410	Straight Chromium No. 430	Straight Chromium No. 442	Straight Chromium No. 446
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	28.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	....	68.49	....	....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	14.00¢
8 to 16	48, 60, 72	14.50¢
7	48, 60	15.75¢
6	48, 60	17.00¢
4, 5	40	17.50¢
3	40	18.50¢
2½	24, 30	19.00¢
2	24, 30	21.00¢
Carbon		
40	100, 110	6.75¢
35	65, 110	6.75¢
30	65, 84, 110	6.75¢
24	72 to 104	6.75¢
17 to 20	84, 90	6.75¢
14	60, 72	7.25¢
10, 12	60	7.50¢
8	60	7.75¢

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	*Cr*	*V*	*Mo*	*Co*	*Base per lb*
18	4	1	—	—	.... 82¢
18	4	1	—	5	....$1.29
18	4	2	—	—	.... 93¢
1.5	4	1.5	8	—	.... 59¢
6	4	2	6	—	.... 63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Armature	4.70¢ to 5.05¢
Electrical	5.20¢ to 5.45¢
Motor	5.95¢ to 6.30¢
Dynamo	6.65¢ to 7.50¢
Transformer 72	7.15¢ to 8.25¢
Transformer 65	7.85¢ to 9.20¢
Transformer 58	8.55¢ to 9.90¢
Transformer 52	9.35¢ to 9.70¢

F.o.b. Chicago and Gary: armature through motor only. F.o.b. Granite City add to lower quotation 0.55¢ for armature through and including 72, and 0.45¢ for balance.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb	$2.70 to $2.75*
Joint bars, 100 lb	3.75
Light rails (from billets) per 100 lb.	3.05

* CF&I charges $3.05.

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.55¢
Tie plates, Pittsburg, Calif.	3.70¢
Track bolts	7.00¢
Track bolts, heat treated, to railroads	7.25¢

C-R SPRING STEEL

Base per pound f.o.b. Pittsburgh, Cleveland

0.08 to 0.40 carbon	3.45¢
0.41 to 0.60 carbon	4.95¢
0.61 to 0.80 carbon	5.55¢
0.81 to 1.05 carbon	7.05¢
1.06 to 1.35 carbon	9.35¢

Worcester, add 0.20¢

CLAD STEEL

Base prices, cents per pound

	Plate	*Sheet*
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

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* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Birmingham

	Base Column	*San Francisco*
Standard & coated nails*	91	112
Galvanized nails*	91	112
Woven wire fence†	97	120
Fence posts, carloads††	104	...
Single loop bale ties	94	118
Galvanized barbed wire**	111	131
Twisted barbless wire	111	...

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* Also Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80-rod spools, in carloads. †† Duluth only.

	Base per 100 lb	*San Francisco*
Annealed fence wire‡	$4.10	$5.1145
Annealed, galv. fencing‡	4.55	5.5645
Cut nails, carloads‡‡	6.15	...

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‡ Add 10¢ at Worcester. ‡‡ Wheeling only, Pittsburgh add 15¢ (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.45	4.55	4.55	4.45	4.55	4.45	4.55	4.55
Sheets									
Hot-rolled	4.30	4.20	4.30	4.50	4.20	4.30	4.20	4.30	4.30
Cold-rolled	5.30	5.20	5.30	....	5.20	5.30	5.20	5.30	5.30
Galvanized	..	5.95	....	....	5.90	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.20	4.30	....	4.20	4.30	4.20	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.20	....	....	4.20	4.30	4.20	4.30	....
Beams	....	4.20	....	....	4.20	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.35	4.45	....	4.35	4.45	4.35	4.45	4.45
Bar shapes	....	4.35	....	....	4.35	4.45	4.35	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless.
Others f.o.b. Pittsburgh only.
Base price, $200.00 per net ton.

One producer allows 1 point less discount on steel buttweld.

Standard, threaded and coupled

Steel, buttweld	*Black*	*Galv.*
½-in.	48	30½
¾-in	51	34½
1-in.	53½	37½
1¼-in.	54	38
1½-in.	54½	38½
2-in	55	39
2½ and 3-in.	55½	39½
Wrought Iron, buttweld		
½-in.	+11	+35
¾-in.	+ 1½	+25
1 and 1¼-in.	4	+16½
1½-in.	9½	+13
2-in.	10	+12½
Steel, lapweld		
2-in.	44½	28
2½ and 3-in.	48½	32
3½ to 6-in.	50½	34
Steel, seamless		
2-in.	43½	27
2½ and 3-in.	46½	30
3½ to 6-in.	48½	32
Wrought Iron, lapweld		
2-in.	1½	+20
2½ to 3½-in.	4	+16
4-in.	8	+10½
4½ to 8-in.	6	+12

Extra Strong, plain ends

Steel, buttweld		
½-in.	46	30
¾-in.	50	34
1-in.	52	37
1¼-in.	52½	37½
1½-in.	53	38
2-in.	53½	38½
2½ and 3-in.	54	39
Wrought Iron, buttweld		
½-in	+ 6½	+29
¾-in.	+ ½	+23
1 and 1¼-in.	4	+16½
2-in.	10	+12½
Steel, lapweld		
2-in.	43½	28
2½ and 3-in.	48½	33
3½ to 6-in.	50½	34
Steel, seamless		
2-in.	42½	27
2½ and 3-in.	46½	31
3½ and 6-in.	50	34½
Wrought Iron, lapweld		
2-in.	4½	+16½
2½ to 4-in.	13	+ 6
4½ to 6-in.	9	+10½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft. inclusive.

		Seamless*		Electric Weld	
OD in in.	Gage BWG	Hot-Rolled	Cold-Drawn	Hot-Rolled	Cold-Drawn
2	13	$17.84	$20.99	$17.30	$20.36
2½	12	23.99	28.21	23.27	27.36
3	12	26.68	31.40	25.88	30.46
3½	11	33.35	39.26	32.35	38.08
4	10	41.40	48.70	40.16	47.24

* One company charges approx. 2 pct less.

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in., del'd Chicago	$98.70
6-in. to 24-in., del'd New York	95.50
6-in. to 24-in., Birmingham	85.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	112.30

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)*

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	46
½ in. and smaller	44	..
½ in. through 1 in.	..	44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in. and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate	65 and 10
In bulk	75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)	*Base per 100 lb*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.65
F.o.b. Lebanon, Pa.	5.80

Small Rivets

(7/16 in. and smaller)	*Percent Off List*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55

Cap and Set Screws

(In packages)	*Percent Off List*
Hexagon nead cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, oval points	57
Milled studs	29
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe	9.5¢ to 16.0¢
Eectrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, minus 300 mesh, 98%, 99.8+% Fe	90.0¢ to $1.75
Aluminum	23.0¢
Antimony	46.0¢
Brass	24.0¢ to 28.5¢
Copper, electrolytic	30.625¢
Copper, reduced	30.5¢
Cadmium	$2.40
Chromium, electrolytic, 99% min.	$3.50
Lead	24.0¢
Manganese	50.0¢
Molybdenum, 99%	$2.65
Nickel, unannealed	51.5¢
Nickel, spherical, minus 30 mesh	53.0¢
Silicon	29.0¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	$1.11
Tungsten, 98%, 99%	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$13.50 to $14.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	16.00 to 17.00
Foundry, Byproduct	
Chicago, del'd	$23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.40
New England, del'd	21.75
Seaboard, N. J., f.o.b.	20.50
Philadelphia, f.o.b.	19.50
Swedeland, Pa., f.o.b.	19.50
Ashland, Ohio, f.o.b.	18.25
Painesville, Ohio, f.o.b.	19.45
Erie, del'd	19.95
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birmingham, del'd	16.71

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Carloads, Per 1000
First quality, Pa., Md., Ky., Mo. (except Salina, Pa., add $5)	$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	11.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Chester	$69.00

Magnesite Brick

Standard, Balt., and Chester	$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite

	Std. ⅜-in. grains
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	$30.50 to 31.00
in sacks with fines	35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, pet net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢	$11.85

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.45-4.97	$5.66-5.81	$5.90-5.92	$4.85-5.36	$5.98-6.55	$4.87	$4.58	$4.91	$5.65-5.73	$8.50-8.65	$8.80	$10.38	$10.53
New York	4.74-4.79	5.70[1]-5.95[1]	6.19	5.08-5.58	6.05-6.30	5.09-5.14	4.77-4.82	5.05-5.08	5.78	8.58-8.73	8.73-8.88	10.23-10.43	10.43-10.58
Boston	4.88	5.74	6.28	5.64	6.90	5.23	4.94	5.09	5.96	9.05	9.20	10.51	10.66
Baltimore	4.27	....	5.62	4.79	....	4.72	4.69	4.84	5.66	....	....	.....	.....
Norfolk	4.90	....	....	5.30	....	5.15	5.15	5.20	6.00	....	....	.....	.....
Chicago	4.20	5.00	5.88	4.35	5.35-6.65	4.55	4.35	4.35	5.00-5.10	8.20	8.35	9.50	9.65
Milwaukee	4.42	5.22	5.87	5.02	5.57	4.77	4.57	4.57	5.33[4]	8.53[4]	8.68[4]	9.78[4]	9.98[4]
Cleveland	4.20	5.00[1]	5.74	4.52	5.95	4.55†	4.67	4.35	5.00-5.10	8.64	8.79	9.50	9.65
Buffalo	4.25	5.15	6.06	5.26	5.72	4.96	4.40‡	4.40‡	5.10	8.20	8.35	9.50	9.65
Detroit	4.60	5.45	6.07	4.80	5.70	4.90†	4.80	4.50	5.16	8.72-8.87	8.87-9.02	9.94-10.17	10.14-10.32
Cincinnati	4.59	5.22	5.57	4.80	....	4.96	4.80	4.76	5.59	8.85	9.00	10.16	10.31
St. Louis	4.59	5.39	6.17-6.27	4.69-5.24	5.97	4.89-4.94	4.74	4.74	5.62	8.82	8.97	10.07	10.27
Pittsburgh	4.20-4.25	5.10[1]	5.65	4.30-4.35	....	4.55	4.35	4.35	5.00	8.20	8.35	9.50	9.65
St. Paul	4.66	5.46	6.01	4.76	....	5.01	4.81	4.81	5.94	....	....	.....	.....
Omaha	5.31	....	6.76	5.41	....	5.66	5.41	5.46	6.06	....	....	.....	.....
Indianapolis	4.52	5.31	5.96	4.62	5.72-5.87	4.87	4.67	4.67	5.52	....	....	9.97	10.17
Birmingham	4.45[11]	....	5.80	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.13	....	....	.....	.....
Memphis	4.91[11]	5.98[1]	5.08[11]	5.11[11]	5.23[11]	5.21[11]	5.01[11]	5.01[11]	5.50	....	....	.....	.....
New Orleans	*5.08[11]	6.44[1]	....	5.28[11]	....	5.38[11]	*5.10[11]	*5.18[11]	6.34[6]	....	....	.....	.....
Houston	5.55	....	7.21	5.65	....	5.90	5.70	5.70	7.00	9.40	9.25	10.40	10.55
Los Angeles	5.70	7.25[1]	7.30	6.00	8.60[6]	5.35	5.15**	5.45	7.25[14]-7.35[14]	9.55[15]	9.40[15]	10.95[15]	11.15[15]
San Francisco	5.35[8]	6.55-7.25	7.05-7.45	5.70[8]	8.60	5.30	5.10**	5.00	7.40	9.55[15]	9.40[15]	10.95[15]	11.15[15]
Seattle	5.45[4]	7.25[2]	7.10[2]	6.15[4]	....	5.60[4]	5.30[4]	5.65[4]	7.35[14]-7.45[14]	8.70[15]	9.70[15]	.....	11.30[15]
Portland	7.70[4]	7.25[2]	7.10	5.85[4]	....	5.70[4]	5.40[4]	5.65[4]	7.45[14]	....	8.95[6]	.....	11.30[15]
Salt Lake City	6.40	....	7.85	6.70	....	6.00	6.25	6.56	7.55	....	....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham.
† Up to ¾ in. thick and 90 in. wide.
‡ Add 41¢ for sizes not rolled at Buffalo.
** Add 15¢ for sizes not rolled at Geneva.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT* PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	40.00	40.50	41.00	41.50	.....
Birmingham	38.88	39.38	.....	.....	.....
Buffalo	40.00-42.38*	40.00-42.88*	40.50-43.38*	.....	.....
Chicago	38.50	39.00	39.50	40.00	.....
Cleveland	38.50-39.75*	39.00-40.25*	39.50-40.75*	.....	.....
Duluth	39.00	39.50	40.00	40.50	.....
Erie	38.50	39.00	39.50	40.00	.....
Everett		45.00	45.50	.....	.....
Granite City	45.25	45.75	46.25	.....	.....
Neville Island	42.00	42.50	42.50	43.00	.....
Provo	39.00	39.50	.....	.....	.....
Sharpsville	43.00	43.50	43.50	44.00	.....
Steelton	40.00	.....	.....	.....	46.00
Struthers, Ohio	42.50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	38.50	39.00	39.50	40.00	.....
Troy, N. Y.	.....	.....	.....	.....	46.00
Youngstown	43.00	43.50	43.50	44.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	48.75	49.25	.....	.....
Boston	Steelton	6.27	46.27	.....	.....	.....	52.27
Brooklyn	Bethlehem	3.90	43.90	44.40	44.90	45.40	.....
Cincinnati	Birmingham	6.09	44.97	45.47	.....	.....	.....
Jersey City	Bethlehem	2.39	42.39	42.89	43.39	43.89	.....
Los Angeles	Provo	6.93	45.93	44.43	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	41.53-42.78*	42.03-43.28*	42.53-43.78*	.....	.....
Philadelphia	Bethlehem	2.17	42.17	42.67	43.17	43.67	.....
Philadelphia	Swedeland	1.31	46.31	46.81	47.31	47.61	.....
Philadelphia	Steelton	2.81	42.81	.....	.....	.....	48.81
San Francisco	Provo	6.93	45.93	46.43	.....	.....	.....
Seattle	Provo	6.93	45.93	46.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	46.00	46.50	47.00	.....	.....

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* Republic Steel Corp. price. Basis: pig iron at Cleveland and Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—$53.50; f.o.b. Buffalo—$54.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $58.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $65.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Phila., New York, Birmingham.

Carload lots (bulk)	$145
F.o.b. Rockwood, Tenn.	$150
Less ton lots (packed)	189.00
Delivered Pittsburgh	151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$51.00	$52.00
F.o.b. Pittsburgh.	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk	7.80
Ton lots	9.45
Briquet, contract, basis, carlots, bulk freight allowed, per lb of briquet	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; $78.75 f.o.b. Niagara Falls; $77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe..	16.90	17.50	18.10
97% Si, 1% Fe..	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	16.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, Contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	19.45	19.85	20.00

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

..Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C.	97.00	98.50	99.75
0.50% max. C.	93.00	94.50	95.75
9.00% min. C.	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe Cr 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.

Ton lots	14.60¢
Less ton lots	15.85¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. Si 56%, Ti 9%, Ca 5%.

Ton lots	17.90¢
Less ton lots	19.40¢

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b, plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.25
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound Contained V_2O_5	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo.	80¢
Molybdenum oxide in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$152.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy.	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.20¢
Ton lots	7.70¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	10.50
Ton lots	11.25

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

Eastern	Central	Western
$1.20	$1.23	$1.21

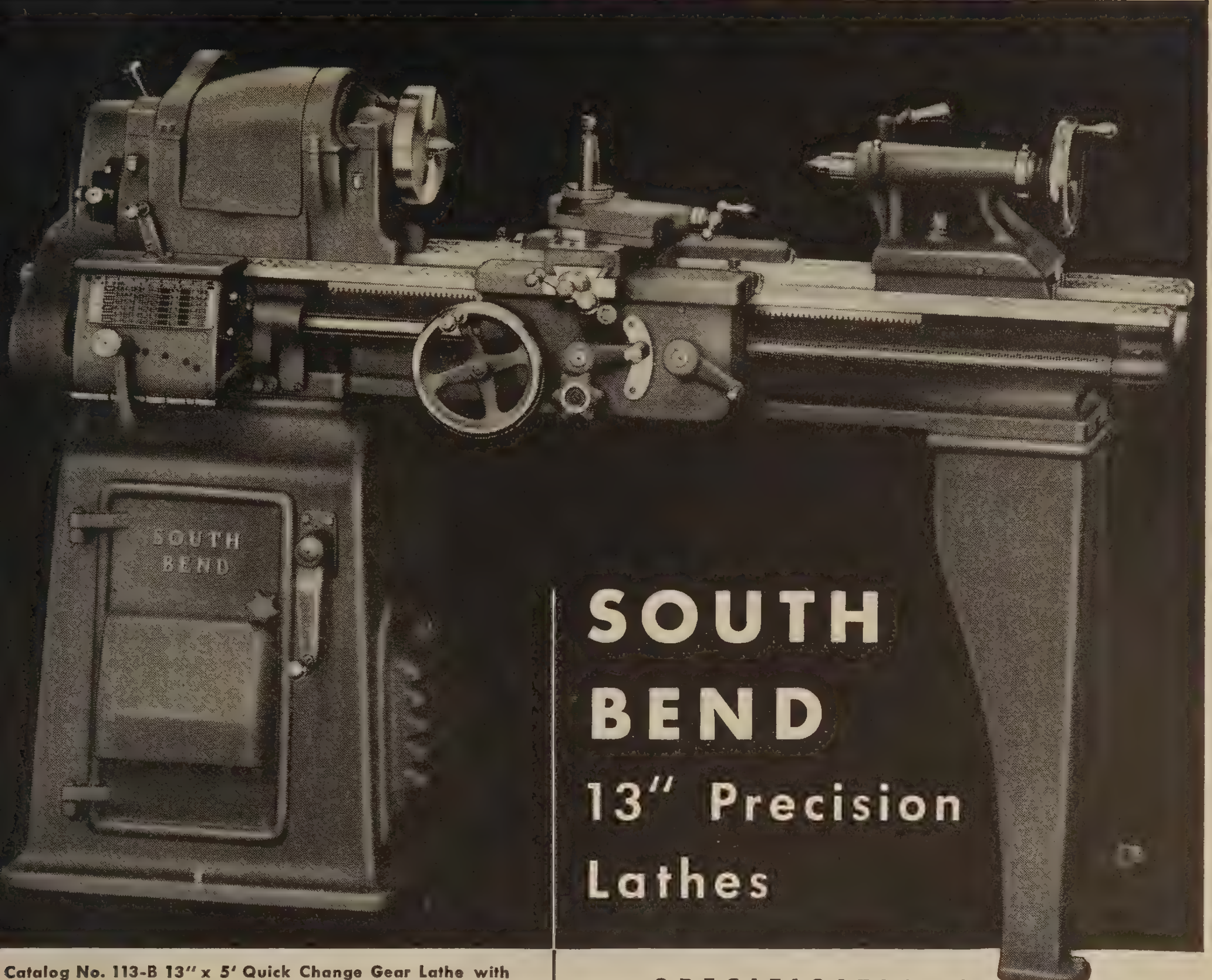
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots.	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.	
Carload lots	39.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B	$6.25



SOUTH BEND
13″ Precision Lathes

Catalog No. 113-B 13″ x 5′ Quick Change Gear Lathe with 3 phase, 60 cycle, 220 volt, A. C. motor and drum switch; f. o. b. factory $1153.50

South Bend 13″ Precision Lathes offer many advantages where close-tolerance machining is required. They are economical of power, accurate, fast, and versatile; and have capacity to handle chuck work up to 13″ in diameter, and between-center jobs up to 8″ x 52″. Substantial savings in capital investment, floor space, and labor cost often result from their installation.

The Quick Change Gear model is popular for production operations, maintenance, and service work. The Toolroom model has sufficient capacity to handle a large variety of toolroom work—its accuracy insures perfect results. Numerous tools and attachments are available for special jobs.

SPECIFICATIONS

SWINGS: 13⅛″ over bed and saddle wings; 8¾″ over saddle with chip guard removed.

BED LENGTHS	4, 5, 6, and 7 feet
DISTANCE BETWEEN CENTERS	16 to 52 inches
COLLET CAPACITY	11/16 inch
SPINDLE BORE	1 inch
SPINDLE SPEEDS: Eight	34 to 875 r.p.m.
POWER LONGITUDINAL FEEDS: 48 R.H. or L.H.	.0015″ to .0841″
POWER CROSS FEEDS: 48	.0006″ to .0312″
THREAD CUTTING: 48 R.H. or L.H. pitches	4 to 224 per inch
CROSS SLIDE TRAVEL	8⅛″
COMPOUND REST TOP ANGULAR FEED	3⅛″
TAILSTOCK SPINDLE TRAVEL	4¼″
TAILSTOCK TOP SET-OVER	15/16″

PRICE RANGE OF SOUTH BEND 13″ PRECISION LATHES

Quick Change Gear Lathes	**$1054 to $1162**
Toolroom Lathes	**$1418 to $1494**

(Prices f. o. b. factory, less electrical equipment)

Other South Bend Precision Lathes are made with 9″, 10″, 14½″, 16″, and 16/24″ swings. We also manufacture Precision Turret Lathes with ½″ and 1″ collet capacities, and a 14″ Drill Press in bench and floor models.

Write for literature on the South Bend tools. Immediate deliveries can be made and a Time Payment Plan is available.

TRADE MARK SOUTH TWIN BEND ENGINE LATHES REG. U.S. PAT. OFF. & OTHER COUNTRIES

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HOW TO SABOTAGE A SHAFT

The crankshaft is an important, expensive part of the modern, high speed engine. It represents many hours of precise, highly skilled workmanship. Yet the crankshaft can be sabotaged in a few minutes . . . if the bearings are not exactly right. In fact, without the right fit, correct alloy and proper lubrication method, excessive wear develops or the bearings freeze to the shaft.

Johnson Bronze knows and appreciates the vital part that sleeve bearings play in any motive unit. Its speed, efficiency and economy of operation depends to a very great extent on the bearings. That is why we insist on quality and precision in every bearing we produce. And that is why so many leading manufacturers depend entirely on Johnson Bronze for all of their sleeve bearings.

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JOHNSON BRONZE
SLEEVE BEARING HEADQUARTERS
BRANCHES IN 20 INDUSTRIAL CENTERS

PERSONALS

(Continued from page 112)

• **H. C. Buckingham,** formerly treasurer, has been elected to the newly-created office of vice-president in charge of plant operations of the Thor Corp., Chicago. **Raymond J. Healy** has been elected secretary-treasurer, and **Roy W. Wiley** has been appointed director of purchases, succeeding Mr. Healy. Mr. Buckingham joined Thor in 1935 as assistant to the controller, later becoming controller and general manager of the Toronto plant. In 1942 he became controller for the corporation and assistant treasurer and in 1943 was elected treasurer. Mr. Healy became assistant to the president of Thor in 1933 and two years later was elected secretary of the corporation. Mr. Wiley joined the corporation in 1923 and became successively salesman, special sales promotion representative and assistant purchasing agent.

• **M. L. Boyle,** sales manager, Hydraulic Press Div., A. B. Farquhar Co., York, Pa. has been transferred to the Philadelphia office, operating under the name of J. H. Wood. Mr. Boyle has been designing engineer of the Hydraulic department of Farquhar and was successively chief engineer and sales manager of the department.

• **Karl G. Clement** has been appointed deputy comptroller of the Port of New York Authority. Mr. Clement was previously associated with the Vick Chemical Co., and the Bendix Aviation Corp. of N. Y. and South Bend, Ind.

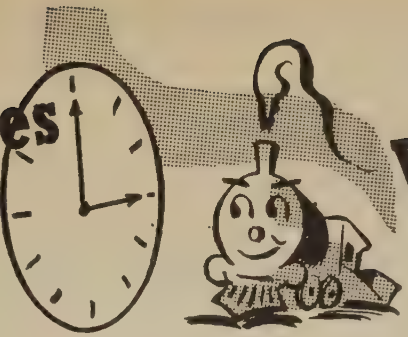
• **C. B. Murphy** has been appointed by Lima-Hamilton Corp. to represent the firm in the southwest, with his headquarters in Dallas.

• **Marvin H. Kirkeby** has been appointed a sales representative of Alpha Metals, Inc. Brooklyn, in the territory of Minnesota and North and South Dakota.

• **Lloyd L. Lee** has been appointed manager of the Detroit office, Cleveland Republic Tool Corp. Mr. Lee was formerly vice-president in charge of sales, Plan-O-Mill Corp. He was previously associated with the Olds Motor Works, Wolverine Machinery Co. and Wilcox-Rich Div., Eaton Corp.

• **Harry C. Williams** has been appointed general sales manager, H. K. Ferguson Co., Cleveland. Mr.

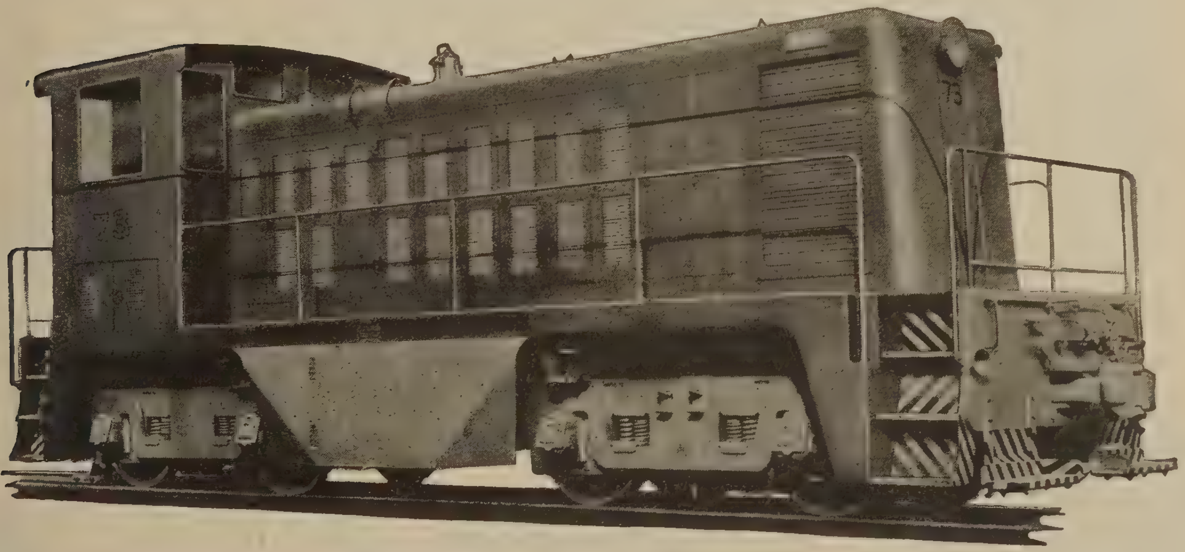
Are your locomotives CLOCK WATCHERS?



Then Switch to Diesel

WHITCOMB LOCOMOTIVES

LET'S LET THE RECORDS SPEAK: They show, among their other important advantages, that Whitcomb Industrial Diesel Electric and Diesel Mechanical Locomotives ARE AVAILABLE almost 100% of every 24 hours! That's a FACT taken from the records. And an *important* fact to those who invest in industrial locomotives, because switching and hauling services assigned to them must be performed at *any* and *all* times. The power supplied by Diesel engines is always on tap—plenty of power for starting heavy loads, hauling long drags and getting back in a hurry. WHITCOMB LOCOMOTIVES are versatile and adaptable; operating costs are surprisingly low, and maintenance costs less than you would reasonably expect.



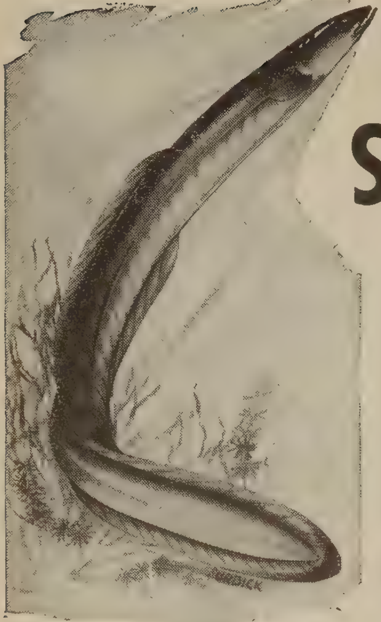
Diesel Electric and Diesel Mechanical Locomotives to 95 Tons

THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS



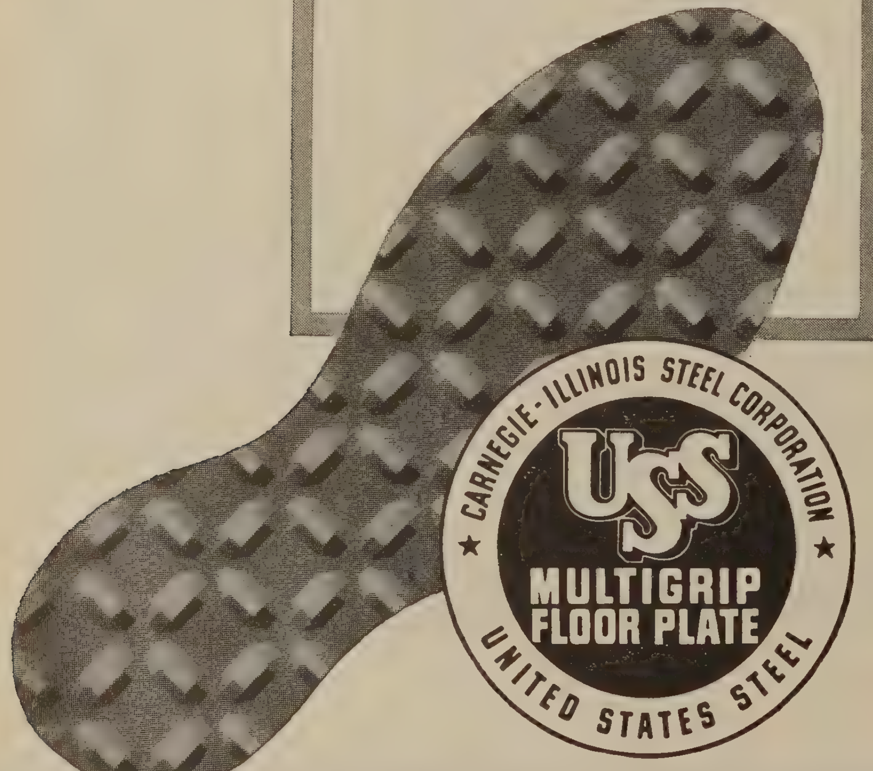
Slippery?

• Smooth plant floors can become slippery as an eel. Grease and water can make a smooth floor treacherous underfoot . . . and accidents cost money.

Where sure footing is essential install U·S·S Multigrip Floor Plate. Multigrip's evenly-spaced risers provide skid resistance and traction in all directions. Whether floors are wet or dry, Multigrip Floor Plate reduces accidents due to slipping and falling.

Multigrip is safe, durable, economical—installations are permanent, reducing plant maintenance costs.

Get further information about Multigrip from your nearest steel warehouse or write to us direct.



CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh and Chicago
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York

8-538

UNITED STATES STEEL

Williams was formerly associated with General Electric Co. and the Chemical and Dye Corp.

• **John Krause, Jr.** has been appointed assistant manager of sales, industrial fasteners division, Oliver Iron & Steel Corp., Pittsburgh. Mr. Krause joined Oliver in 1927. He was formerly sales office manager in the industrial fasteners division.

• **David A. White, Jr.,** formerly public relations officer for the Buffalo regional office of the Veterans Administration, has been named public relations manager, National Gypsum Co., Buffalo. Appointed commodity advertising managers were **Stephen F. Tucker,** gypsum and metal products; **Frederick C. Egloff,** acoustical products; **John J. Hickey,** paint and insulation board.

• **Douglas B. Whitney,** works manager of the Harrison Radiator Div., General Motors Corp., Lockport, N.Y., since 1931, has been appointed general manager of the division, succeeding **Frank M. Hardiman,** who died June 11.

• **John T. Porter** has been appointed Pacific Coast representative for the department of education, American Type Founders Sales Corp., with headquarters in the company's Los Angeles offices. Prior to joining ATF he was instructor at Santa Barbara College.

• **A. S. Nippes** has been appointed superintendent of manufacturing, Jeannette Div., Elliott Co., Jeannette, Pa. Mr. Nippes joined the Elliott Co. in 1945 assuming charge of the equipment and methods department. He was formerly associated with Hygrade Sylvania Corp. and Bendix Aviation Corp.

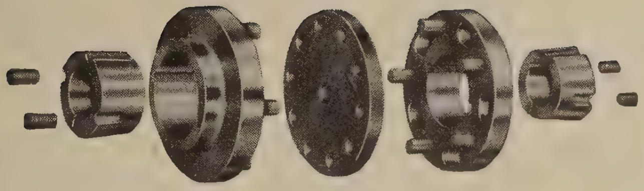
• **William J. Wade** has been appointed assistant to the executive vice-president, Willys-Overland Motors, Toledo. Mr. Wade joined Willys-Overland in 1946 and has been head of the distribution planning group of that company. He was formerly connected with Spicer Mfg. Corp., Surface Combustion Corp. and the DeVilbiss Co.

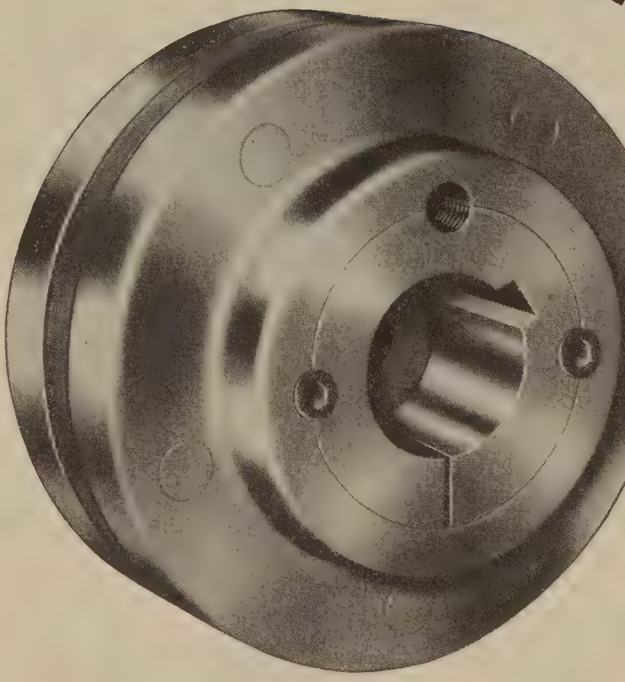
• **William Arthur** has been placed in charge of the newly-formed Mid-Atlantic region of the Allis-Chalmers Mfg. Co. general machinery division's field organization, with headquarters in Philadelphia. **Frank Freyler,** manager of the Cincinnati district office has been appointed

NOW! TAPER-LOCK* FLEXIBLE COUPLING!

It's new! It's different! A packaged Flexible Coupling . . . available from stock . . . and ready to install *without reboring.* It's another Dodge development for mechanical power transmission that saves time, cuts cost!

*TRADE MARK REGISTERED U.S. PAT. OFF.





- ✓ Built with the famous TAPER-LOCK bushing (patented).
- ✓ Available from stock in a wide range of standard bores. *No reboring!*
- ✓ Fastens to shaft with the firmness of a shrunk-on fit.
- ✓ Easy on—easy off. Can be disconnected without moving coupled machines.
- ✓ Compact design occupies minimum space on shaft. Safe! No projecting parts.
- ✓ "Pin Type" design with oak tanned sole leather center disc provides flexibility, resiliency and strength.
- ✓ Made of close grained semi-steel and machined all over to insure balance and true running.

DODGE MANUFACTURING CORPORATION
MISHAWAKA, INDIANA

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER

(or write the factory) for complete bulletin on this newest Dodge contribution to better mechanical transmission of power. The Transmissioneer—your local Dodge distributor—is a factory trained specialist. Look for his name under "Power Transmission Equipment" in your classified phone book.

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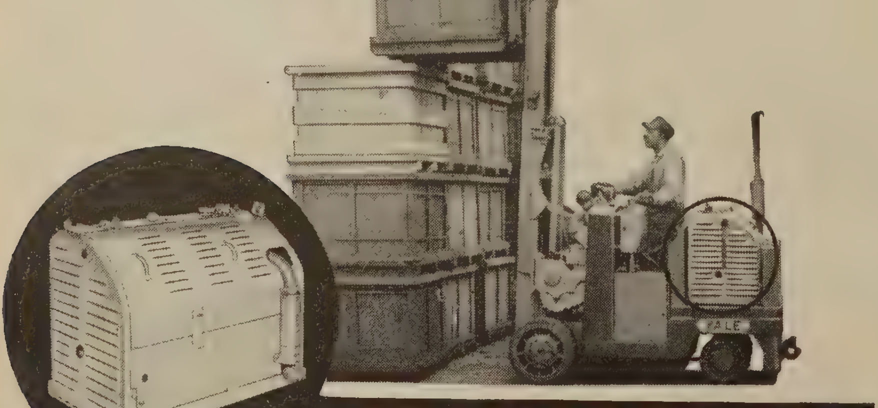
READY-POWER
AND THE
TWIN CITY HIAWATHA
USE THE SAME PRINCIPLE TO PROVIDE
"CONSTANT-PEAK" POWER

THE MILWAUKEE ROAD

Modern streamliners, the crack trains that rush over the rails of America's top lines today, are driven by the same power principle provided by Ready-Power.

Electricity generated right on the truck chassis assures ample power for *continuous* operation at constant speeds. Ready-Power Units are noted for economical operation and low maintenance. Any electric truck, new or old, can be equipped with Ready-Power. Write for detailed information.

Ready-Power-equipped Yale fork truck



THE READY-POWER CO.
3820 Grand River Avenue, Detroit 8, Michigan

to succeed Mr. Arthur as Philadelphia district office manager. **W. F. Daly** who has been manager of the power section of the company's steam turbine department, succeeds Mr. Freyler in Cincinnati.

- **Howard Marston,** sales and service engineer at the Boston branch of Minneapolis-Honeywell Regulator Co., has been appointed industrial manager of the Brown Div. in Minneapolis and St. Paul. **Earl S. Bush** has been named Chicago industrial sales engineer for the steel industry for the Brown Div. succeeding **A. J. Potts. Larry E. Singleton** has been appointed to succeed Mr. Bush. **I. K. Farley** has been appointed industrial manager of the Houston branch of the Brown Div.

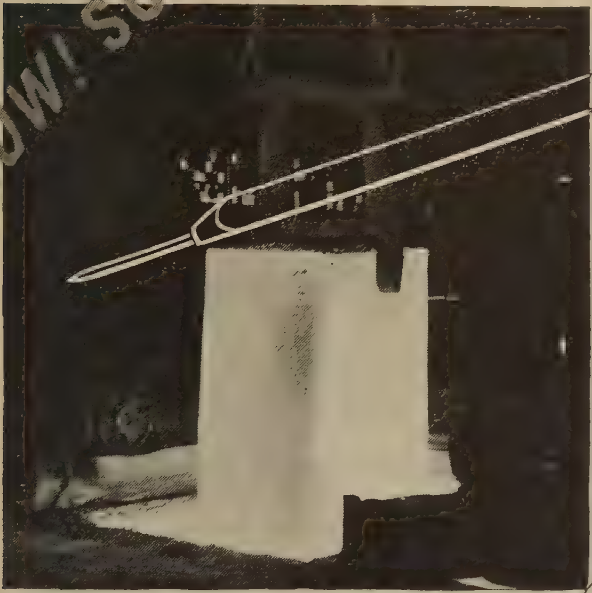
- **George Alexander,** who joined the General Electric Co. in 1930, has been named assistant to the manager of the company's laminated plastics plant in Coshocton, Ohio, in charge of the new varnish plant. Mr. Alexander was formerly works engineer at Coshocton. **Edward G. Gray** has been appointed works engineer of the Coshocton laminated plastics plant. Mr. Gray joined the company in 1925 and in 1928 was named Cleveland sales representative of the plastics division. He was successively sales manager and commercial engineer of laminated products.

- **Al Vos** has been named manager of the Detroit office of Yale & Towne Mfg. Co. He was formerly associated with E. F. Tindolph Co. and the Stamford division of Yale & Towne. In 1938 he was appointed regional sales representative. Mr. Vos joined the Detroit office early this year.

- **M. A. Sievert** has been appointed engineer in the technical service department, Reynolds Metals Co., Louisville.

- **George B. Mackey,** who joined Westinghouse Electric Corp. as a lamp salesman in Philadelphia 26 years ago, has returned there as manager of the Middle Atlantic district of the company's lamp division. He was formerly manager of Philadelphia branch sales office, syndicate manager at Bloomfield and manager of the lamp division's southeastern district at St. Louis. Mr. Mackey succeeds **Harry A. Croasdale,** district manager since

NOW! SCIENTIFICALLY ACCURATE...



Control of oxygen, vital in steel processing is measured accurately by the Heat Prover.

Cities Service Heat Prover Service speeds up production . . . cuts fuel costs.

COMBUSTION CONTROL

Remarkable Cities Service Instrument—the Industrial Heat Prover, tells how much fuel is wasted, how much is needed for Maximum Productive Capacity

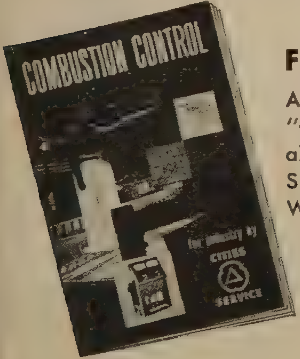
Steel, of all industries, requires scientific control of combustion. Whatever type of furnace or heating operation is used, control of waste . . . of oxygen . . . and of combustibles is vitally essential.

Cities Service Combustion Engineers using the remarkable Industrial Heat Prover can tell you in one quick analysis exactly how much fuel is wasted unburned, how much energy is wasted in uselessly heating excess air and whether or not the maximum amount of heat is extracted from the waste products.

This instrument can be designed for use on industrial furnaces of every type, regardless of the fuel used.

You are welcome to this service without charge and without any obligation or commitment from you.

Aside from cuts in fuel cost, a Heat Prover analysis can step up quality and quantity of production.



FREE:

A fact-filled booklet entitled "Combustion Control" is available upon request. Write Cities Service Oil Company, Sixty Wall Tower, Room 162 N.Y. 5.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

–it's from HERE

to HERE

● It's an easy matter to define the "comfort zone" in a plant. It's that eight or ten feet above the floor that must be heated for employee comfort. But it's quite another matter to heat it economically and effectively when thirty feet of air space extend above it to the roof.

Such a problem faced the Minweld Steel Company in its new fabricating plant in Pittsburgh—and a Dravo *Counterflo* Heater solved it for them.

This powerful unit discharges warm air above the heads of the workers, circulates it through the working area, and returns it without drafts to the base of the heater for reheating and recirculating. This method maintains uniform heat throughout the 6,500 square foot working area—even though two 19-foot square truck doors open at each end, and metal-siding walls are broken by an abundance of windows.

Installation of the self-contained Dravo *Counterflo* Heater required only a fuel line, a power line and a small venting stack—no boiler room or piping. Ductwork, too, is unnecessary because capacity is ample to blanket a radius of 250 feet completely and *evenly* with warm air. The unit is entirely automatic . . . it is shut off at night—and at 6 A.M. the watchman simply flips a switch and the plant is warm fifteen minutes later.

Bulletin IS-516 contains valuable information about the Dravo *Counterflo* Heater which you can apply to your own heating problems. Write for it, Heating Section, Dravo Corporation, Dravo Building, Pittsburgh 22, Pa.

In a fabricating plant such as Minweld Steel Company, man-hours and efficiency are vitally important. "In a recent two week period," Owner William Minnotte says, "we estimated a saving of twenty man-hours because our men didn't have to stop work and try to get warm around old-fashioned coal stoves. Increased productivity, of course, is also tied to the increased comfort of our employees."

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs

DRAVO CORPORATION

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK
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Sales Representatives in Principal Cities

Mfd. and sold in Canada by: Marine Industries, Ltd., Sorel, Quebec

DRAVO

1942, who has been appointed manager of the lamp division's newly-established Central Station Div.

• **C. B. Householder,** formerly a sales engineer, has been named manager of fuel tank department, Goodyear Tire & Rubber Co., Akron, Ohio. He is succeeded by **E. M. Humphrey,** who is being transferred from the New York office of the aviation products division. **W. A. Carlson** of the division's Miami office succeeds Mr. Humphrey. **G. R. Price,** Akron Staffman, replaces Mr. Carlson in Miami.

• **George W. Kratz** has been elected a director of Pittsburgh Consolidation Coal Co., Pittsburgh, filling the vacancy created by the recent death of **Barton P. Turnbull.** Mr. Kratz is a vice-president of the company.

• **Gustave Heinemann,** since 1934 chief chemist at the Corpus Christi, Tex. plant operated by Southern Alkali Corp., has assumed the additional duties of technical director. Prior to his association with Southern Alkali, Mr. Heinemann served as chemical engineer at Pittsburgh Plate Glass Co.'s alkali producing plant at Barberton, Ohio.

OBITUARIES

• **Oscar E. Hesse,** secretary-treasurer, Logan Engineering Co., Chicago, died June 15.

• **John L. Morrissey,** 68, vice-president, Ferry Cap & Set Screw Co., Cleveland, died June 24.

• **John Edwards,** retired assistant treasurer, Mesta Machine Co., Pittsburgh, died June 20.

• **Lawrence H. Underwood,** assistant to vice-president in charge of operations, Youngstown Sheet & Tube Co., Youngstown, Ohio, died June 26.

• **Howard G. Moss,** office and personnel manager of Nash-Kelvinator Corp., Detroit, died June 14.

• **Alvin W. Belfour,** 44, production superintendent of the Chevrolet Motor Div., General Motors Corp., Tonawanda, N. Y., died June 22.

• **Charles H. Moritz,** 72, former president of Aluminum Co. of America, Pittsburgh, died June 20.

• **C. E. Sauls,** former director of Alabama State Docks and Terminals, Mobile, died June 29.

DIES LAST LONGER ON FERRACUTE INCLINABLE PRESSES

Extra long gibs guide tools accurately, give extra long life for dies.
Unusually heavy frame reduces deflection, lengthens die life . . . .

Check these additional features that will lower your costs:

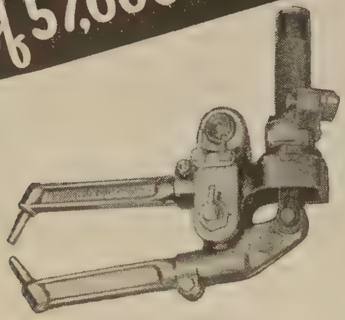
- *Ferracute low-maintenance clutch.*
- *Adjustable ground gibs and ram.*
- *Ample shut height.*
- *Safety flywheels.*
- *Quick application of standard roll feeds.*
- *Back shaft equipped with roller bearings on larger presses.*
- *Bronze bushed.*
- *Air ram balance can be applied easily.*
- *Quick, easy change-over from single stroke to continuous operation.*
- *Immediate or very prompt delivery.*

Ferracute Presses "never wear out." You can figure on lower maintenance on every set of dies you buy in the next 50 years. Choose economical, low-maintenance Ferracute Inclinables for your utility press line-up. For cutting, punching, blanking, stamping, shallow drawing and forming. Models from 5 to 150 tons.

- *Write for full specifications and information.*

FERRACUTE MACHINE CO., Bridgeton, N. J., U. S. A.

You can change this STANDARDIZED WELDING GUN to any one of 57,600 varieties



by merely inserting different interchangeable standardized jaw extensions and points

5 Basic standardized gun types take care of 90% of welding requirements

Interchangeable air and hydraulic operating cylinders

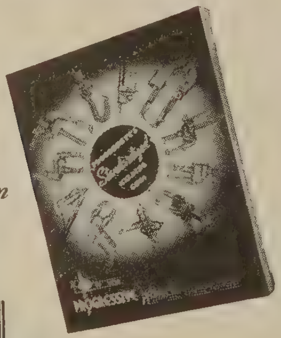
Infinitely variable adjustment to maintain point alignment in any direction

Eliminates special gun designing time and cost

Almost 100% salvage value in transferring gun to a different job

Jaw extensions, cylinders, switches, fulcrum pins, etc., interchangeable between different gun types

For Complete Information Write for Bulletin No. 402



IT PAYS TO WELD

PROGRESSIVE
WELDER COMPANY
3050 E. OUTER DRIVE, DETROIT 12, U.S.A.

Republic Personnel Get Work Simplification and Quality Control Courses

Cleveland

• • • **Operating personnel** of Republic Steel Corp. will attend classes in quality control and work simplification at Baldwin-Wallace College, Berea, Ohio, this summer, according to an announcement by Earl M. Richards, vice president in charge of operations, Republic Steel Corp.

The announcement was made at the conclusion of a 3-day conference of district managers and other personnel from Republic steel mills, manufacturing divisions and mines.

Mr. Richards said that Republic has retained Dr. Irving S. Burr of Purdue University to conduct the instruction in quality control, a statistical technique now becoming widely recognized throughout the industry as an effective tool toward cost cutting, conserving material, and assuring consistently high quality of shipments. Dr. Burr will instruct a selected group from all Republic plants, sending them back to their respective areas as trained in quality control to instruct their own groups.

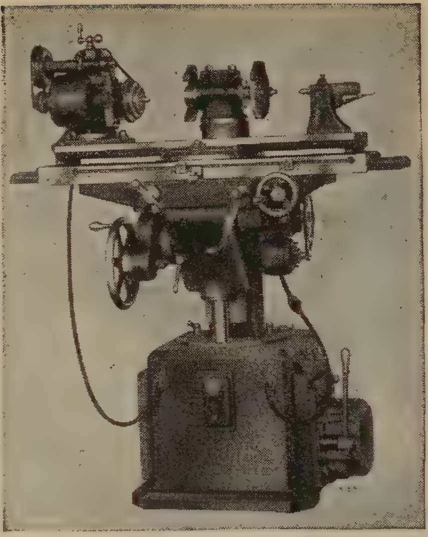
Republic industrial engineers will come to Baldwin-Wallace again this summer to continue studies of work simplification — a program which has been under way in Republic since 1935. While "at college", the engineers live and eat in the dormitories and spend a full 8-hr day in classroom sessions. The work simplification training will be under direction of Allen H. Mogensen of New York, a consulting engineer, and an authority on work simplification training.

Extend Reciprocal Trade Agreements to '49; Few Tariff Changes in View

Washington

• • • **Chances are** that very few changes will be made in the nation's tariff schedules during the next year.

Congress, in extending the Reciprocal Trade Agreements until June 30, 1949, removed the authority to recommend tariff changes from the departments and agencies of the



LeBlond No. 2 grinds a wide variety of reamers, mills, taps, cutters.

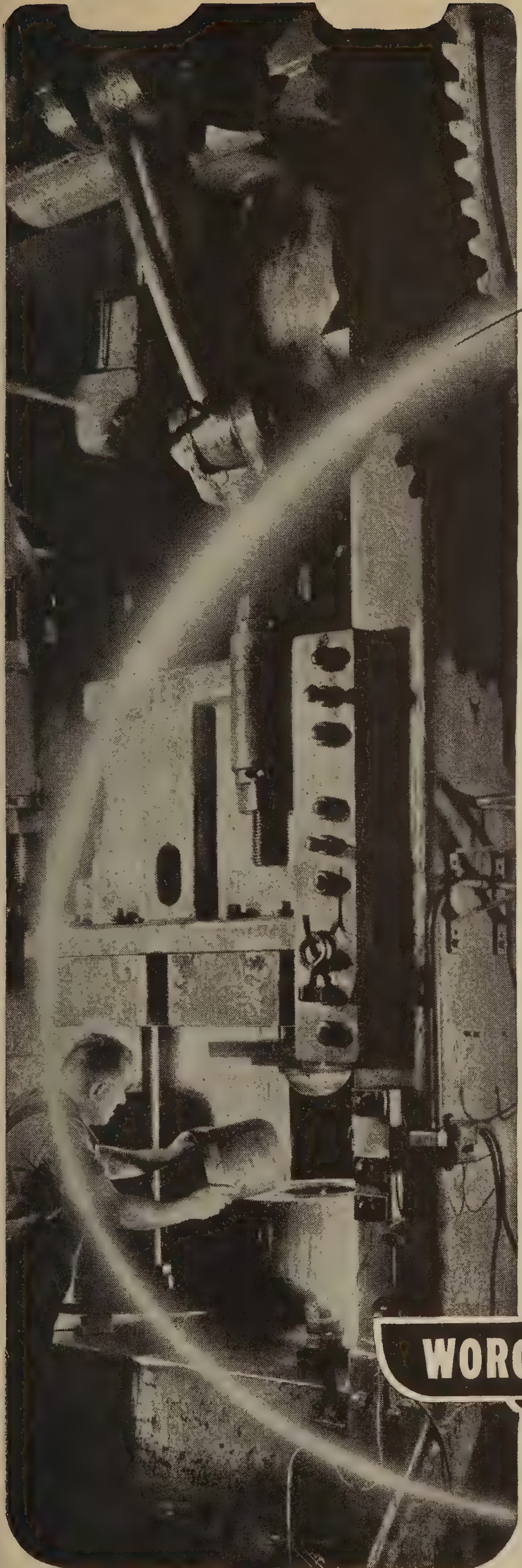
CUTTER GRINDER PROVIDES FOUR GRINDING SPEEDS

The No. 2 Cutter Grinder, produced by the R. K. LeBlond Machine Tool Company, Cincinnati 8, Ohio, brings added capacity to the tool room with four grinding speeds. Speeds of 6500, 5100, 4000, and 3100 rpm can be obtained easily and quickly by means of a single lever. The "secret" of the LeBlond No. 2 is that the table revolves completely round the stationary wheel head. Thus the drive is simple and direct from a permanently and substantially mounted motor.

Since the LeBlond No. 2 is one of the most universal of its type, an almost unlimited variety of reamers, mills, taps, and cutters can be ground with the equipment furnished as standard.

Another outstanding feature of the LeBlond No. 2 is its flexibility. It can be operated sitting or standing, from front or rear, and swung around to the precise working angle desired.

By doing the job of tool maintenance easier and better, faster and cheaper, the LeBlond No. 2 Cutter Grinder becomes a vital asset to any tool room. For further information on the LeBlond No. 2, write The R. K. LeBlond Machine Tool Company, Cincinnati 8, Ohio.



’PLANE TALK about STAMPINGS for AIRCRAFT!

No industry in this era of spectacular mechanical and structural advances has more urgent need for economical production of lighter, stronger, precision metal parts than the builders of aircraft.

With the demand for supersonic speeds, today’s aircraft engineers must consider in their designs two factors without which such speeds cannot be attained — light weight and great strength.

Presteel stampings have already proved their worth to the aircraft industry of today. With modern equipment, Presteel engineers, technicians and craftsmen are ready to develop and produce precision parts for the aircraft of tomorrow.

Let us help you to improve production and reduce manufacturing costs. Write direct or consult a Presteel representative. They are conveniently located in leading industrial centers.

ALEXANDRIA, VA.
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INDIANAPOLIS
LOS ANGELES
NEW YORK
PHILADELPHIA
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TORONTO, CANADA

WORCESTER PRESSED STEEL CO.

ALLOY STEELS AND OTHER METALS COLD FASHIONED SINCE 1883

407 BARBER AVENUE
WORCESTER 6, MASS.

Better cooling
Better lubrication
Better finishes
Longer tool life

with

Oakite Soluble Oil

HERE are a few reasons why hundreds of metal-working plants rely on Oakite Soluble Oil for a wide range of machining and grinding operations:

1. Superior cooling and lubricating action
2. Cleaner cutting; precision finishes
3. Longer tool life with fewer regrinds and settings
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5. Effective retarding of rust
6. Thorough rinsing away of chips
7. Stable emulsions; longer solution life
8. High dilution ratio; greater economy
9. Greater resistance to rancidity; less skin infection

Free Demonstration — The Oakite Technical Service Representative in your vicinity will be glad to show you what a slick job Oakite Soluble Oil can do. Ask him or write us for the FREE 20-page booklet with formulas for ferrous and non-ferrous metals.

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Technical Service Representatives Located in Principal Cities of United States and Canada

OAKITE

Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

executive branch of the Federal Government and transferred it to the bipartisan Tariff Commission.

The Tariff Commission is now charged with the responsibility for holding full and detailed hearings on any proposed upward or downward revisions in tariff schedules.

And, since any new rates proposed by the President may not be put into effect for 90 days if the White House proposals do not jibe with Tariff Commission recommendations, the chances for any except minor revisions in duties are slim indeed.

President Truman had asked Congress to extend the existing trade agreements act without change for a period of 3 years. Congress ignored this request. It removed the inter-agency Committee for Reciprocity Information from the picture, transferred the source of recommendations to the Tariff Commission, and approved a 1-year extension.

Mr. Truman signed the bill into law with "regret", and opinioned that the new law prescribes "a new, complicated, time-consuming and unnecessary procedure for the negotiation of reciprocal trade agreements."

He said that the changes wrought by Congress would "necessarily hamper and obstruct the negotiation of new agreements, a defect which is particularly undesirable in view of the act's limitation to a single year."

Nevertheless, the power to make recommendations for revisions now is lodged with the bipartisan Tariff Commission, which Congress noted had "proven its ability". And the new law is calculated not to impose upon the commission "burdens which could not be handled expeditiously with its present personnel."

Kyle Mine Is Commended

Washington

• • • **Employees and** officials of the Kyle mine, of the H. C. Frick Coke Co., at Fairchance, Fayette County, Pa., have been commended by the Bureau of Mines for operating in full conformance with all provisions of the Federal Mine Safety Code.

The Kyle mine, inspected in May, is the fourth found by Bureau inspectors in District "A" to have

When
HEATING FURNACE
Repair and Outage Costs Climb

Remember
REMMEY
RM
SEMISILICA BRICKS

Heating furnace roofs, open hearth regenerator roofs, hot blast stoves and other mill furnaces operating continuously enough to cause "first quality" and "super duty" brick to vitrify and spall . . . yet which are shut down frequently enough to cause silica brick to spall . . . need Remmey RM semisilica brick.

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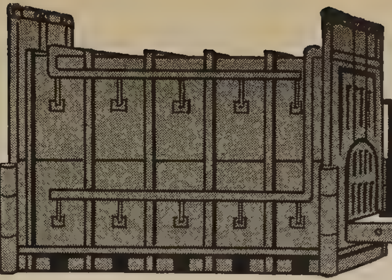
RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Advertisement

JULY 1948

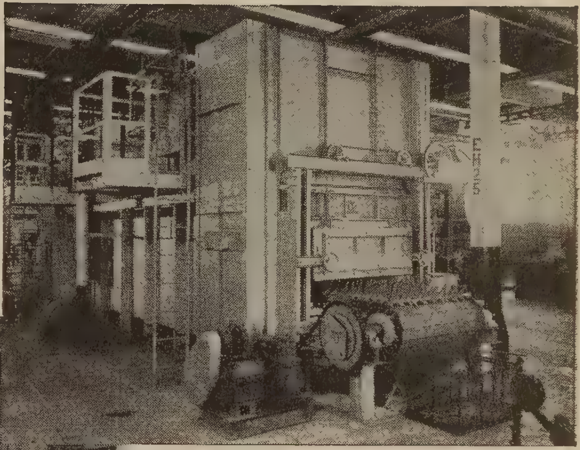


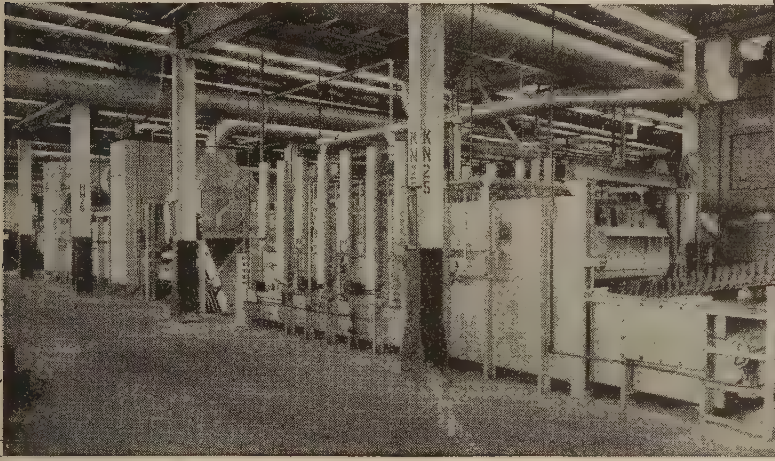
R-S FURNACE FACTS

ISSUED MONTHLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH QUALITY HEATING OF METALS

New R-S Furnace Installation in Mid-West Automobile Factory

This new R-S Furnace is a Harden-Quench-and-Draw unit for the heat treatment of miscellaneous steel forgings. The hardening furnace is a continuous belt conveyor type, radiant tube gas-fired, and operates with a controlled atmosphere. The work goes directly into the quench-tank onto a continuous slat conveyor which automatically delivers it to the draw-furnace conveyor.





The Draw Furnace is of the forced convection type and gas-fired. Production is one ton per hour.

Upper picture shows view of the continuous line at the discharge end; lower picture at the charging end. Automatic temperature controls with approved safety features are incorporated in the design.

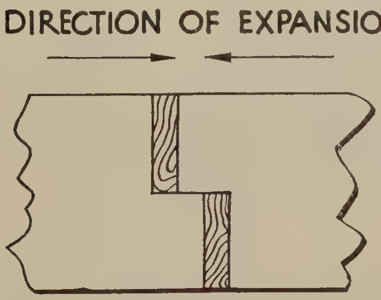
At a heat treating plant in Lapeer
Was a furnace which acted most queer.
Said the boss, "I confess
Had I bought an R-S
Of all maintenance we should be freer."

For the sake of the rhyme we have implied that burdensome maintenance is unusual. The plain truth is that it is commonplace for furnace maintenance costs to run high. That is one of the reasons that Maintenance is so high in the Steel business. Maintenance is 3 times Profits according to A.I.S.E. figures. But that's for the entire industry. For those steel men using R-S furnaces it is lower; on some R-S Furnaces there has been virtually no maintenance for years of steady use. It pays to buy R-S.

JMLco P-AA1

All Furnaces must have Expansion Joints but...

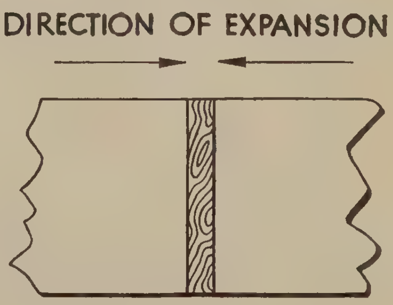
Expansion joints in brickwork are common to all furnaces but even in such simple details R-S shows its unique superiorities of design.



R-S

Note comparative sketches of R-S versus Usual design. The latter takes care of expansion but permits unrestricted heat flow through the joint material. This means loss of fuel, and possible damage to unprotected parts.

R-S design offsets the expansion joints so that the heat is bottled up and stays where it is needed. That's one of the reasons for the increased efficiency of R-S heat control.



USUAL

"Good Cutting Oils Sure Keep You Out of Trouble"

...says "CHIP" WRIGHT

"Whenever there's trouble with tools or finishes or jobs fall behind schedule, the first thing I check is the cutting fluid, because when that's not exactly right, it's surprising how it can upset the whole job. You just can't get around it, cutting oils do make a big difference . . . and it isn't smart to quit trying until you find the right one. It doesn't make sense to put up with headaches that can be avoided. That's why I think it pays to rely on experienced cutting oil people. They come up with sound, practical assistance."

Here's a Practical Tip:

For Your Toughest Jobs Try THREDKUT

You've heard of THREDKUT and what it has accomplished on tough jobs where other oils have failed. The stabilized balance between its uniformly high anti-weld value and its other desirable cutting characteristics, make it especially efficient in the machining of tough, stringy metals . . . and for the more difficult operations such as thread cutting, tapping, broaching and gear shaping. Here's a cutting fluid that can help you. For complete information, write for the THREDKUT Booklet.

Another Time-Tested Stuart Product

STUART *oil engineering goes with every barrel*

D.A. Stuart Oil CO.
EST. 1865 LIMITED
2737 SOUTH TROY STREET, CHICAGO 23, ILL.

no code violations. District "A", in which 500 mines have been inspected by the Bureau since Jan. 1, 1948, includes the bituminous fields of Pennsylvania, northern West Virginia, Ohio and Maryland.

Withdraws Quotations On Aluminum Ingot

New York

• • • **Federated Metals,** division of American Smelting and Refining Co., has withdrawn price quotations on secondary aluminum ingot. According to E. I. Newhouse, Jr., president, Federated "will quote the market as nominal, since the scrap market no longer exists in the sense that supplies are available at any assured or reasonable level."

Mr. Newhouse went on to say that, "In recent months an exceptionally heavy demand for secondary aluminum ingot, coupled with a shortage of primary aluminum and a diminishing supply of war surplus material, has resulted in spirited bidding on the scrap market. This has, in turn, forced the price of secondary aluminum continuously upward to a level far in excess of the virgin metal."

Federated, according to Mr. Newhouse, feels that this is an unhealthy situation, and would prefer to see a stabilized price at a much lower level. The company will continue to supply customers' requirements at lowest possible price but "until such time as the scrap market stabilizes will quote on each individual order, based on ability to cover scrap at that particular time."

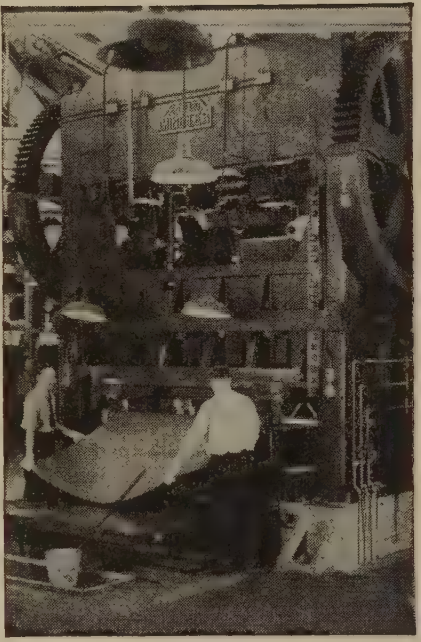
Consumers of secondary ingot can help bring the price of aluminum down and restore order in the secondary aluminum market, it is said, by placing orders only for their immediate requirements.

Kellogg Builds Propane Decarbonizing Towers For Foreign Refineries

New York

• • • **Two large propane** decarbonizing towers have recently been completed by the M. W. Kellogg Shops in Jersey City. Measuring 12 ft in diam, 75 ft in length and having a wall thickness of 2⅝ in., the towers will be shipped overseas

IS YOUR PRESS WORK Strenuous?



STRENES METAL cast dies are the right tools for severe drawing and forming jobs—large stampings like airplane propeller blades . . . heavy stampings like wheel rims and tractor seats.

The users of **STRENES METAL** dies include manufacturers of appliances, airplane parts, automobiles, trucks, tractors, burial caskets and vaults, implements, blowers, etc. Since many of the stampings are extremely large, **STRENES METAL** dies frequently weigh in excess of 10,000 lbs.—sometimes as much as 25 tons.

Whatever your drawing and forming problems may be, put them up to us. It will pay you.

THE ADVANCE FOUNDRY CO.
100 SEMINARY AVENUE
DAYTON 3, OHIO

Strenes METAL
FOR DRAWING AND FORMING DIES

BALANCED PHYSICALS

IT'S A GOOD TRICK
BUT
IT'S

EASY WITH

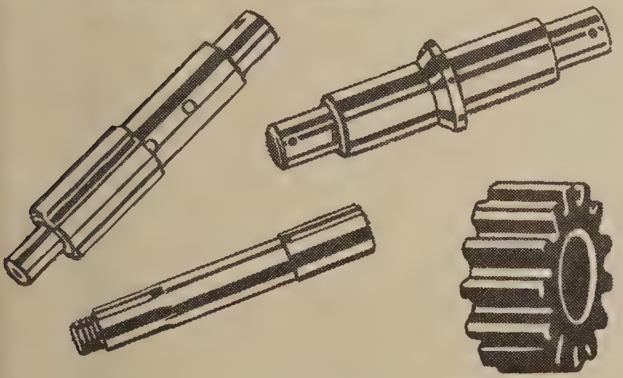
BL

Strain-TEMPERED BAR STEELS

Bliss & Laughlin, Inc., specializes in engineering the "right steeel to fit the job."

That means more than size, shape, grade, finish or analysis. It means a steel of definite chemical analysis, made to precision standards with the proper combination of *balanced physical properties* to give you optimum results in machining, fabricating, assembly and service.

You will find it profitable and advantageous to use B&L Cold Finished Strain Tempered Bar Steels tailored to meet your individual requirements.



STRAIN-TEMPERING—

- Improves Bar Ductility
- Promotes Bar Uniformity
- Eliminates Heat Treating
- Checks Warpage Tendencies
- Reduces Production Costs
- Lengthens Service Life

COLD FINISHED BAR STEELS AND SHAFTING

BLISS & LAUGHLIN, INC.

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The
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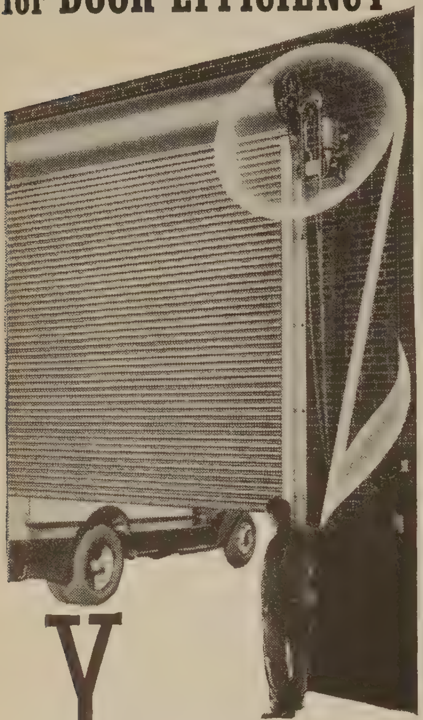
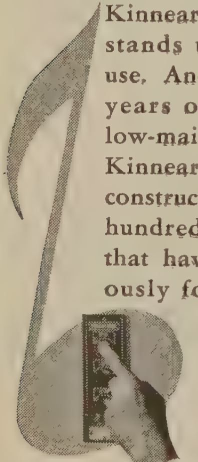
for DOOR EFFICIENCY



You keep *door performance* in tune with plant efficiency when you install KINNEAR Motor Operated Rolling Doors. They respond instantly to the touch of a control button, from one or more switches placed anywhere in your plant. Their smooth, efficient, *vertical* action saves space, prevents accidents, avoids traffic tie-ups. They coil compactly out of the way overhead, safe from damage. The husky Kinnear Motor Operator stands up under hardest use. And there are extra years of protection and low-maintenance service in Kinnear's rugged, all-steel construction—as proved by hundreds of installations that have served continuously for 20, 30 and 40 years! For the "right notes" on efficient doors, send for Kinnear details today.



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Factories: 1760-80 Fields Ave., Columbus 16, Ohio
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KINNEAR
ROLLING DOORS

for installation in two foreign refineries.

The 2⅝ in. thick wall of these vessels was required to withstand an unusually high internal pressure of 500 psi, and to provide ⅛ in. of corrosion allowance due to the presence of active sulfur compounds in the reduced crude oil which will be processed.

Principal material of construction was a carbon-silicon steel with a tensile strength of 70,000 psi, approximately 30 pct stronger than usual pressure vessel steels.

The plate thickness required 24 layers of weld metal in each joint. All principal joints were welded automatically by a continuous submerged arc process. External and internal attachments were welded by using a ferritic low hydrogen type electrode.

Weld inspection included radiographing of main butt joints with a 400,000 kva X-ray unit. All strength welds not radiographed were magnetic particle inspected. In addition various test plates were tested destructively.

The interior of the vessels contain numerous supporting brackets for steam coils, distributor toughs and baffles. These were magnafluxed to insure freedom from cracks.

Finally the welded vessels were stress relieved in specially constructed furnaces to eliminate variations in grain structure resulting from welding.

Fuller Co. Awarded Contract

Washington

• • • **Contract for** the general construction of 150-bed Veteran Administration's hospital at Manchester, N. H., has been awarded the George A. Fuller Co. of Boston on the low bid of $3,568,594. Installation of elevators and dumbwaiters was awarded the Warsaw Elevator Co. of Warsaw, N. Y., on a bid of $97,836.

Directs Strategic Materials

Washington

• • • **Evan Just,** of New York has been appointed director of the Strategic Materials Division of the Economic Cooperation Administration. Formerly secretary of the Tri-State Zinc and Lead Ore Producers Association, of Picher, Okla.,

Tempilstik°

the amazing Crayons that tell temperatures
TEMPIL STIK 300°

A simple method of controlling working temperatures in:

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It's this simple: Select the Tempilstik° for the working temperature you want. Mark your workpiece with it. When the Tempilstik° mark melts, the specified temperature has been reached.

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Available in these temperatures (°F)

125	275	500	1100
138	288	550	1150
150	300	600	1200
163	313	650	1250
175	325	700	1300
188	338	750	1350
200	350	800	1400
213	363	850	1450
225	375	900	1500
238	388	950	1550
250	400	1000	1600
263	450	1050	

FREE —Tempil° "Basic Guide to Ferrous Metallurgy" — 16¼" by 21" plastic-laminated wall chart in color. Send for sample pellets, stating temperature of interest to you.

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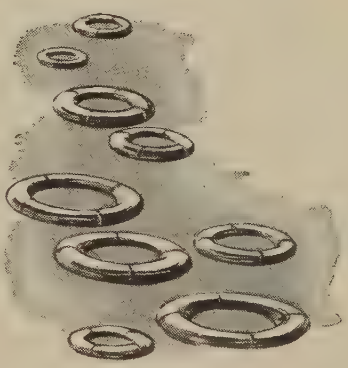

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CONTROL VALVE
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You get many other assurances of long-life speed and accuracy in Grand Rapids Grinders, such as: vibrationless rigidity achieved by massive one-piece column and base casting; patented vertical head adjustment; flanged-type, pre-loaded ball bearing spindle.

*Accuracy within 0.00025 limits

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All inquiries will receive our immediate attention.

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Mr. Just is now on leave from the Engineering and Mining Journal.

ECA Administrator Paul G. Hoffman has established the Strategic Materials Division for the purpose of carrying out those portions of the ECA Act calling for facilitating the production and procurement of materials needed by the United States.

A. C. S. Holds National Symposium on Physical And Organic Chemistry

Syracuse, N. Y.

• • • **Industrial efficiency** will be increased as a result of a new and comprehensive survey of the properties of sulfur, one of the four basic raw materials in chemical manufacture, Dr. James R. West of the Mellon Institute of Industrial Research, Pittsburgh, predicted here as one of the speakers at the American Chemical Society's national symposium on physical and organic chemistry.

"Sulfur is used in the production of a vast number of consumer products. In order to conserve this vital raw material and to use it in the most efficient manner, the scientist and engineer must make thorough studies of the many remaining mysteries concerning its behavior," he told the session.

Professor L. F. Audrieth urged for Government support of research on vital nitrogen chemicals to bolster the country's peacetime economy as well as national defense.

Nitrogen is one of the few inexhaustible raw materials, since it is one of the major ingredients of the earth's atmosphere. "Certain nitrogen compounds, such as ammonia and hydrazine, are actively being considered as fuels, said Professor Audrieth. "With the necessity of conserving coal and petroleum supplies, it seems not unreasonable to consider these substances as alternative and special fuels." During the war the Germans experimented successfully with hydrazine as a power source for submarines.

A chemical compound that softens hard water by causing calcium and magnesium content to vanish was described by Dr. Everett P. Par-

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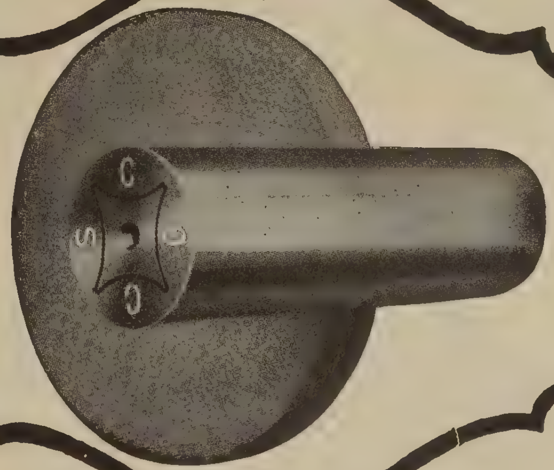
An Exclusive Product made by an Exclusive Method



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LENGTHS
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Year 1845—up to 16 feet
Year 1886—up to 25 feet
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They are carefully ground to our standard manufacturing tolerance, plus nothing to minus .002" on diameters 1-1/8" to 2-7/16" inclusive . . . plus nothing to minus .003" on diameters 2-1/2" to 8" inclusive. Closer tolerance can be furnished, if desired.

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tridge, director of research of the Hall Laboratories, Pittsburgh.

The substance is a phosphorous compound of the group known as polyphosphates. "Practical application of these complex phosphates which are now produced at a rate of millions of pounds annually in the United States, has run far ahead of scientific understanding of how the compounds are actually constructed or why they do the things they do," Dr. Partridge declared.

Bell Shows Net Profit

Buffalo

• • • **Bell Aircraft** Corp. reported net earnings for the quarter ended Mar. 31 of $142,741 after federal taxes, or 33¢ a share, compared with $131,471, or 30¢ a share, in the first 3 months of 1947.

Sale of the company's Burlington, Vt. plant, consummated in January, on which a profit of $689,779 was realized, enabled Bell to show a net profit for the 1948 period.

Canada Proposes More Pig Iron for Foundries Scrap for Steelmakers

Toronto

• • • **Under the** government's proposal that more pig iron be made available to foundry melters by steel producers, it is learned that the Ottawa government will give more assistance to steelmakers in obtaining scrap to offset the loss of iron.

However, to obtain additional scrap it will be necessary to turn to foreign sources of supply, and imported scrap will run to much higher price levels than prevailing ceilings. Announcement has been made that a large shipment of scrap for Canada is being prepared in Australia, while other countries also will be tapped.

The Pacific countries also are expected to contribute large tonnages to the Canadian markets. But there seems little hope at this time of obtaining any large quantities from Europe. In fact Canadian buyers have a number of difficulties to overcome with regard to European purchases. As a consequence they are not showing too much interest until the scrap actually is

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STOCK LISTS

We pride ourselves on our proved customer relationship. It has been our practice always to view our customers as our friends and our transactions with them have never been the ordinary, perfunctory, commercial sort of thing at all. Like any friendships worthy of the name, they demand more than ordinary loyalty, dependability and responsibility. You can depend on us to do everything within our power to co-operate with you on your needs.

P. F. McDonald & Co., carry the most complete stocks of all types of steel in New England—for immediate delivery. Send us your inquiries and orders which will have our careful and prompt attention.

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Since 1874

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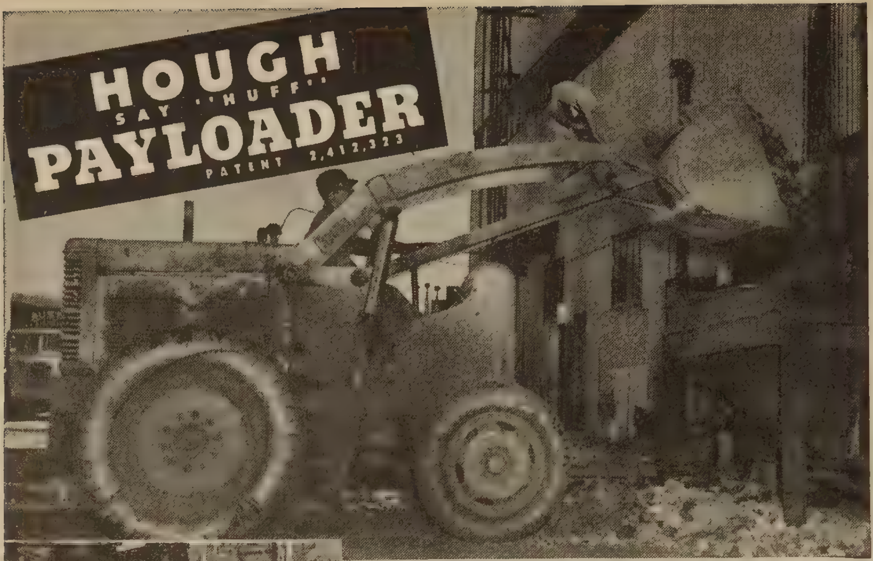
BOSTON 27, MASS.



Quick Solution to Your Material Handling Problems

Speedy Payloaders pay big dividends. They load, unload, carry and dump ore, sand, slag, coal, cinders, scrap, snow . . . haul, lift and push . . . indoors and outdoors. Hundreds of plants report remarkable records in labor, time and money saving — and increased production. Crane Hook and Bulldozer Blade attachments, interchangeable with the bucket, further increase Payloader usefulness.

Send for Complete Details

on the Model HA 10½ cu. ft. Payloader, the ¾ yd. Model HF or the 1¼ yd. Model HL.

THE FRANK G. HOUGH CO.
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TRACTOR SHOVELS SINCE 1920

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FOR over 30 years ERIE has specialized in the manufacture of high quality bolting. We use the very latest equipment for heat treating, machining, grinding and threading. We are certain that we can produce better bolting at a saving to you because we are specialists — send us your bolting specification for our estimate.

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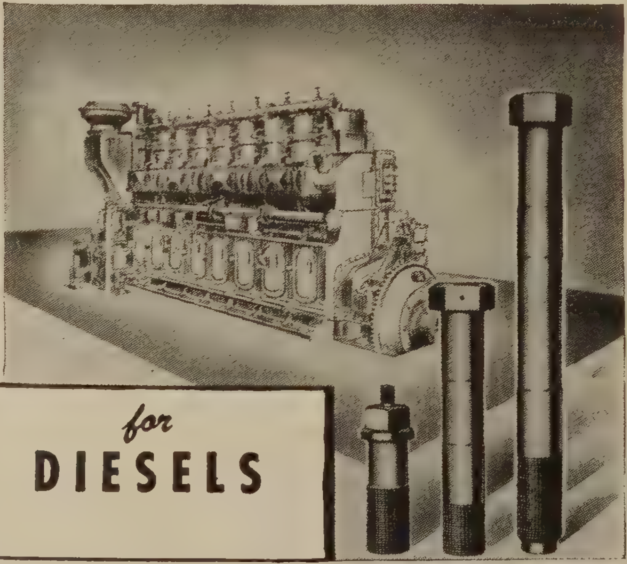

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SUBSIDIARY OF BARIUM STEEL CORPORATION
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STUDS • BOLTS • NUTS ~~ ALLOYS • STAINLESS • CARBON • BRONZE

delivered to a Canadian port.

Minor improvement is reported in domestic supply of scrap, but the overall tonnage is running less than 50 per cent of requirements. Steel mills are drawing heavily on stock piles and these are being depleted rapidly. Unless scrap is available in sufficient quantity, it is likely that Canadian steel production will fall below its present high rate.

Govt. Fights Against Royalty Payments to Cold Metal Process Co.

Cleveland

• • • **Government** attorneys were scheduled to learn whether $9,749,000 will be paid in impounded royalties to Cold Metal Process Co., Youngstown.

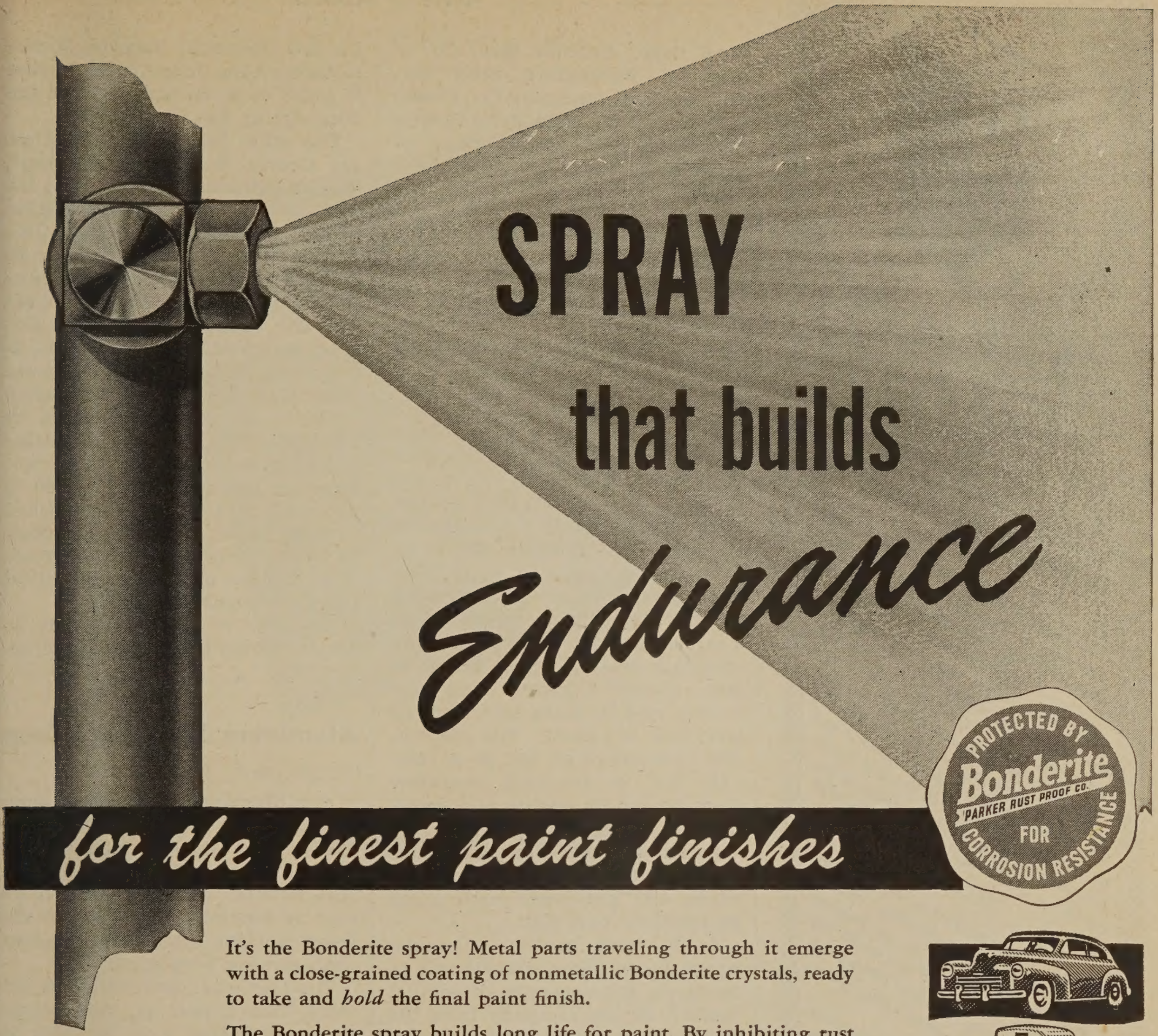
Federal Judge Robert N. Wilkin was to rule on the distribution of the money to the Union National Bank of Youngstown, as trustees for the Leon A. Beeghly Foundation, a religious, educational and charitable organization established in 1940, which acquired part of the 2000 shares of Cold Metal stock in 1940 and the balance in 1945.

The Government was granted a restraining order by Judge Wilkin preventing the court from paying the money which was impounded because of use during the war of patent processes by steel companies doing government work.

Judge Wilkin granted the order on petition of Roy C. Hackley, Jr., special assistant to the attorney general of the United States, after Judge Shackleford Miller, Louisville, Ky., assigned to the U. S. District Court here recently ordered the money released.

The Supreme Court, on two previous occasions, refused the Government's petition to review the case, after the Government lost its original suit filed against Cold Metal in 1943, in the Sixth Circuit Court of Appeals in Cincinnati, and the district court.

Another $9,000,000 in royalties is held up by a completely separate suit by the Government against Cold Metal Process Co. and other steel companies. Involved in the current action as defendants are Youngstown Sheet & Tube Co., American Rolling Mill Co., Bethlehem Steel Co., Jones & Laughlin Steel Corp., Wheeling Steel Corp., Inland Steel Co., Allegheny-Ludlum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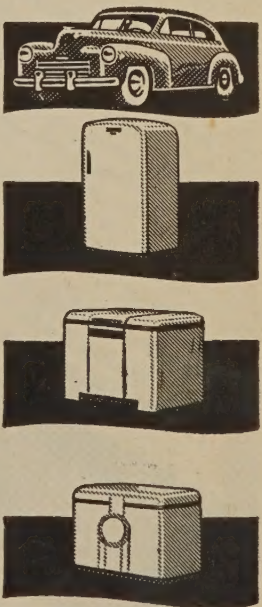
Bonderized products look better longer!



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Guard its good looks—and your customers' satisfaction —by Bonderizing before the final finish. It costs little, adds much. Write today for full information.

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Armco Sets Up Plan for Equalizing Suggestion Awards

Middletown, Ohio

• • • **A new suggestion** plan which places all plants of Armco Steel Corp. under a single over-plan, provides more liberal cash awards and speedier payment to stimulate money-saving ideas by employees according to Charles R. Hook, Armco chairman.

In making the announcement, Mr. Hook stated that the new plan was designed to "equalize awards, stimulate creative ideas, recognize and reward thinking men and women and to make sure that no good idea is wasted. The cooperative thinking of all will be a valuable aid in reducing operating costs, improving quality and speeding production," he said.

Armco has had various suggestion systems in its plants for many years, but previously each plant operated its own plan.

As in most modern successful suggestion systems, awards will be based on a percentage of savings realized by the company from the adoption of a suggestion. Gross savings will be considered as the base for determining the size of awards.

According to the announcement, even the top limit of $2500 may be increased if management considers an idea to be "exceptionally meritorious."

The plan will function first in the plants of the parent company, and it is expected that subsidiary companies like Armco International Corp. and Armco Drainage & Metal Products, Inc. will be included in the plan at a later date.

New IFMA Judge Appointed

New York

• • • **Ralph E. McGee**, manager of Metallurgical Research, International Harvester Co., Chicago, has been appointed as one of the judges for the Industrial Furnace Manufacturers Assn. Prize Article Contest in place of R. H. McCarroll of the Ford Motor Co., deceased.

The other judges of the contest are George W. Mason, president, Nash-Kelvinator Corp., Detroit; Dr. S. R. Scholes, Dean, New York State School of Ceramics, Alfred University, Alfred, N. Y.; Alexander H. d'Arcambal, vice-president and consulting metallurgist, Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn.; and Dr. E. S. Davenport, assistant to vice-president, U. S. Steel Corp., Pittsburgh.

The IFMA contest, sponsored by the Industrial Furnace Manufacturers Assn., Inc., New York, provides for the awarding of $1500 in prizes for the best articles published in trade papers not later than Sept. 30, 1948 on the advantages derived from the use of modern industrial furnaces, ovens or kilns.

The rules of the contest may be obtained from the association office.

Aluminum Shipments Drop

Washington

• • • **Shipments of aluminum** wrought products amounted to 133 million lb in May as compared with 139 million in April, the Census Bureau reports. The 4 pct drop, however, is generally attributed to the fewer working days in May rather than slowing production.

The May total, however, is 25 pct more than a year ago and brings the accumulated total for 1948 to about 707 million lb as compared with 584 million lb for the first five months of 1947.

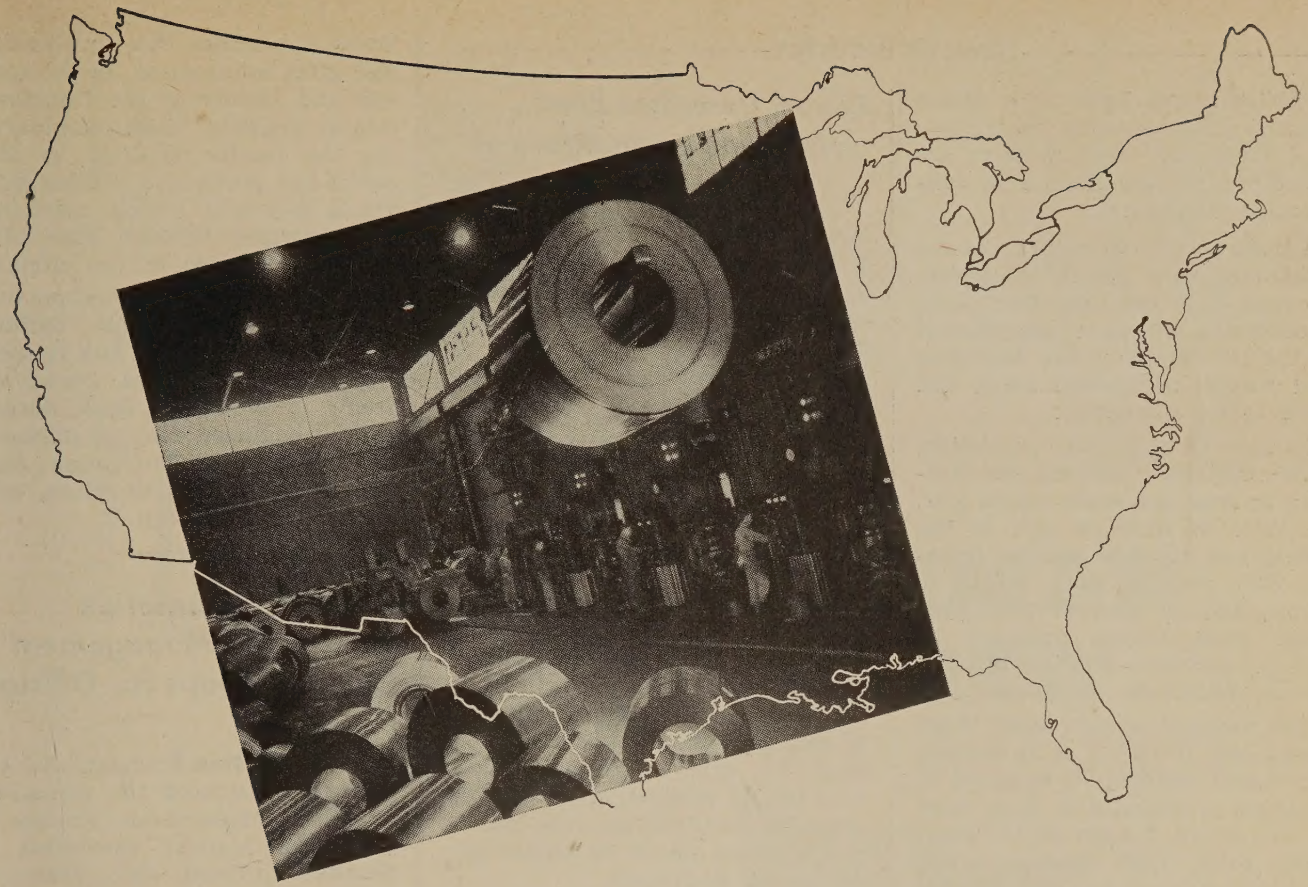
May shipments included 102 million lb of sheet, plate and strip; 14 million lb of structural shapes, bar, rod and wire; and, 15.6 million lb of extruded shapes, tube bloom, and tubing.

Displaced Persons Act Allows 205,000 Entry In Two Year Program

Washington

• • • **The average immigrant** worker entering the United States under the new Displaced Persons Act probably will be a farmer from one of the Baltic states.

But industry has a stake in the 2-year program under which 205,000 DPs will move to the U. S. to



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Since 1878 hundreds of manufacturers in Middle America have specified "Steel from Granite City." Here's why: Granite City steel is of the finest quality, tailor-made to specific requirements. Granite City's central location in the heart of Middle America offers a distinct shipping advantage.

The facilities of Granite City Steel Company have always been large enough to utilize the newest processes of the steel industry . . . yet small enough to pay strict attention to minute details of manufacture that mean finer quality steel.

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Cold Rolled Sheets
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GRANITE CITY STEEL
1878

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Granite City, Illinois

Dallas
Kansas City
Memphis
Minneapolis
Moline
St. Louis

Granite City is the main supplier of steel for Middle America

establish homes here. Such skilled workers as toolmakers, machinists and structural steel workers are scheduled for admittance in substantial numbers.

Immigration authorities are working out a careful screening program to be put into effect soon. Communists who have been planted in the DP camps of the American and British occupation zones will have to be eliminated.

In order to qualify for admission, a DP must have entered the German or Austrian zones before Dec. 22, 1945. At least 30 pct. of the immigrants must be trained farmers who plan to work on U. S. farms, and at least 40 pct. must come from "areas annexed by foreign powers"—Eastern Poland, Lativa, Lithuania or Estonia.

The new act permits some 15,000 aliens now in the U. S. to become permanent residents if approval of Congress is obtained in each case. It will admit 200,000 under eligibility rules, 3,000 orphans under 16 years of age and 2,000 persons who fled Czechoslovakia after the Communist coup.

Report Describes Blast Hole Drilling in Mines of Tennessee Copper Co.

Washington

• • • **How diamond** drills were used successfully for more than 6 years in drilling blast holes at the Tennessee Copper Co.'s mines at Ducktown, Tenn., are described in a report just released by the Bureau of Mines. It is one of a series of Bureau circulars describing diamond-drilling practices in various mines throughout the United States.

Diamond drilling of blast holes at the Tennessee copper mines "has passed the experimental stage and promises to become permanent", according to the report. Advantages are listed as the elimination of rock dust, safer working conditions for drill crews, and lower drilling and production costs. The principal disadvantage, the publication points out, is the higher initial cost of equipment.

In describing the mining and blasting methods employed at the Ducktown mines, the publication also gives information on the geology and history of the Ducktown mining district. Tables summarizing the results obtained by diamond and percussion drilling during a 6-month period extending from January through June 1946, also are included in the circular.

A free copy of Information Circular 7452, "Blast-Hole Drilling with Diamond Drills at the Tennessee Copper Co. Mines, Ducktown, Tenn." by William A. Beck, Bureau mining engineer, may be obtained by writing to the Publications Section of the Bureau of Mines, 4800 Forbes St., Pittsburgh 13.

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Announce Formation Of Local Management Groups for Officials

Cleveland

• • • **Gray Iron** Founders' Society recently announced the formation of local management groups of gray iron foundry executives in Seattle, Portland, San Francisco and Los Angeles.

In the Seattle group Joseph Long, Atlas Foundry & Machine Co., was elected chairman. Other officers were: Dennis Vena, American Foundry Co., Inc., Seattle, vice chairman; W. Orphan, Lake Union Foundry Co., Seattle, treasurer; J. S. McNeill, American Foundry Co., Inc., Seattle, secretary.

The San Francisco group elected S. Russell, Phoenix Iron Works, Oakland, temporary chairman. Officers will be elected at the next meeting of the group.

In Los Angeles and Portland officers of the respective groups will be announced in the near future.

Addressing each group on the Pacific Coast, R. L. Collier, executive vice president of the Socitey, outlined the society's activities since the inauguration of its long-range program last November.

Reviewing progress on the program, he stressed the organization of 40 local management groups of gray iron foundry executives and the founding of a technical department under direction of an expert on the metallurgy of gray iron and foundry problems.

On the question of organization of local groups, he announced that 20 such groups, comprising more than half of all gray iron foundries in the country, have been organized and operating.